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To the End of the Year 1700.

ABRIDG'D

AND

Diſpos'd under GENERAL HEADS.

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The Firſt Containing all the

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And the Second all the

Philological and *Miſcellaneous* Papers.

By *JOHN LOWTHORP*, M. A. and F. R. S.

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AND

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THE
Anatomical, Medical, and Chymical Papers,
PUBLISH'D and DISPERS'D
IN THE
Philoſophical Tranſactions
AND
COLLECTIONS
ABRIDG'D,
AND
Diſpos'd under GENERAL HEADS.

CHAP. I.

Anatomy. Phyſick.

The Structure, External Parts, and common Teguments, of Humane Bodies.

I. 1. EDmund *Melloon* (Born at *Port Leiceſter* in *Ireland*, and ſhewn at *Oxford* 1684. being then 19 Years Old) was 7 Foot 6 Inches high; his Finger 6 $\frac{3}{4}$ Inches long, the length of his Span 14 Inches, of his Cubit 2 Foot 2 Inches, of his Arm 3 Foot 2 $\frac{1}{2}$ Inches, from the Shoulder to the Crown of his Head 11 $\frac{1}{4}$ Inches.

An Iriſh Man *of an Extraordinary Size; by Dr.* Plot. n. 240. p. 184.

By Dr. Molyneux. n. 261. p. 502.

2. In the Year 1682. I saw and measur'd *Edmund Malone* at *Dublin*; His Father, though a proper Man, no way remarkable for his height, but his Mother was of a more than ordinary low Stature: When he stood on the bare Ground with his Shoes off, he measured full 7 Foot 7 Inches in height; that is, about 2 Foot taller than a Man of a common Size.

A Prodigous Os Frontis; by Dr. Tho. Molyneux. n. 168. p. 880.

II. 1. I have measured a Prodigious large *Os Frontis*, which is reserv'd in the *Medicine School* at *Leyden*. It is entire, and differs in no Respects from that of a Man, but in its largeness; and since there's no Creature, especially of the larger sort, that has this Bone at all resembling ours; there's not the least Question to be made, but this formerly belong'd to a Man, and that of a most extravagant Size. From its juncture with the Nasal Bones, to the place where the *Sutura Sagittalis* terminated, the Convex way, 'twas 9 Inches $\frac{1}{10}$; transversly from side to side, still measuring the Convex way, 'twas 12 Inches $\frac{2}{10}$; in thickness, about $\frac{1}{2}$ Inch. I find ordinary Sculls scarce answer it in half Proportion; being one with another about $4\frac{1}{2}$ Inches long, 6 broad, and $\frac{1}{4}$ thick. So that supposing this Bone bore the same Proportion to his Stature, which the same in other Men does to theirs, the Man to whom this Bone belong'd must have been 11 or 12 Foot high. Dr. *Drelincourt*, the present Professor of *Anatomy*, told me, That he found it there when he first came into that place, but never could learn who gave it, where it was found, or whence it came.

That there are some whose Heads are very large in proportion to their Bodies cannot be deny'd; yet generally such Sculls want in thickness, (as this does not,) are ill shaped, and not proportionable; and moreover, I am persuaded there never yet was an Instance of any Head, which by a præternatural Growth, came the least nigh this for Bulk.

Giants; by Dr. Tho. Molyneux n. 261. p. 487.

2. I am not ignorant, that several Authors (as *Tho. Fazellus*, *Athan. Kircher*, *Gaspar Shottus*, and others) both Ancient and Modern, have taken Pains to Register Accounts, not of Gigantick Bones only, but of intire Bodies of vastly Gigantick Men, found buried under ground, or in the hollow Caverns of Mountains: But these Relations are commonly taken up by Hearsay only, and so ill attested, that they deserve but very little Credit. And tho' there is hardly any considerable Collection of Natural Curiosities, or a Printed Description of a *Musæum*, extant, where some part or other of a Giant is not to be met with, yet I am much of the same Opinion, as to most of these Gigantick Remains, with the Historian *Suetonius Tranquillus*, who says of *Augustus Cæsar*, that *Ædes suas non tam Statuarum Tabularumque Pictarum Ornatu, quam Rebus vetustate ac Raritate notabilibus, excoluit; qualia sunt Cetreis immanium Belluarum Fœrarumque Membra prægrandia, quæ dicuntur* Gigantum *Ossa.* And certainly, most of pretended Giants remains in our Days, such I mean as are truly Bone, (for some are only Natural Petrifications, and *Lapides sui Generis*, accidentally so figur'd as to resemble this or that Part of a Man) were Bones belonging to some of the biggest Quadrupeds, as Elephants, or some of the largest sort of Fishes of the Whale kind, called by *Pliny*, as well as *Suetonius*, *Belluæ* and *Belluæ Marinæ*. And I am persuaded, that the large Tooth, mentioned by *Ol. Wormius*, and Fi-

Musæum.

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gured by *Tho. Bartholine*, was nothing elſe than a Tooth of the *Cetus Dentatus*, or Sperma-Ceti-Whale. Nor is it long ſince, that the Bones of the Fore-fin of a Porpeſs or a ſmall Whale, artificially joyned together, were expos'd in *London* by way of publick Shew, as the Skeleton of a Giant's Hand: For all Fiſh of the *Cetaceous* or Whale-kind, have this Fin made up of juſt ſo many Ranges of Joynts, as naturally anſwer our 5 Fingers, and all together does not a little reſemble a Man's Hand. *Cent. 1. Hiſt. Anatom. Hiſt 58.*

But the Prodigious large *Os Frontis* reſerv'd in the *Medicine School* at *Leyden*, cannot be ſuſpected to appertain to any other Creature than a Man: For this Bone in a Man, is of ſo peculiar a Make from the Globoſe ſhape of the Head, that there is not to be found a Bone among all the Animals of the Creation, that bears any reſemblance to its Figure, if we except that of a Monkey; but all this Genus being of a much ſmaller Size than a Man, gives us no Umbrage of Scruple. So that there is no room to doubt of its being a true and genuine Part of a large Humane Animal; as will more clearly appear by comparing the neat Sketches drawn from the Bone it ſelf by Mr. *Hugh Howard*, with a common *Os Frontis* of the ordinary Size in the following Figures; where

Figure 1. ſhews the common Shape and Size of the Fore-head Bone of a Man of an ordinary Stature, with its Convex or out-ſide forward. *a b c d e*, The Line the *Coronal Suture* makes with Indentures, elegantly expreſt, going round the upper Edge of the Bone by which its joyned to both the *Oſſa Bregmatis* or *Verticis*. *e*, The place where the *Coronal* and *Sagittal* Sutures meet. *f*, The part to which the Bones of the Noſe are faſtened. *g g*, The upper part of the Orbits of the Eyes. *h h*, The Holes in the Bone over the Eyes, that give paſſage to the two large Branches of Nerves that ſupply the Frontal Muſcle, and thoſe of the Eye-brows. *i i*, The two Proceſſes or Protuberances that joyn with the firſt Bone of the upper Jaw: theſe by ſome Accident were broken off the large Bone, and therefore are not expreſt in the 2. *Fig.* The meaſure round the Ambit of the *Coronal* Suture from *a*, to *g*, was 10 Inches and $\frac{1}{10}$ of an Inch; In this Bone from *c*, where the *Coronal* and *Sagittal* Sutures meet, to *f*, where the Bones of the Noſe are faſtened, $4\frac{1}{2}$ Inches; from *b*, drawing a tranſverſe Line croſs the Forehead, to *d*, 6 Inches; the thickneſs of the Bone was about $\frac{1}{4}$ of an Inch. *Fig.* 1.

Figure 2. Repreſents the Gigantick Forehead Bone, expreſt in the ſame Poſture with the former, and drawn exactly to the ſame Proportion. *a b c d e*, The *Coronal* Suture, in ſome places a little worn and defaced. *c*, The place where the *Coronal* and *Sagittal* Sutures meet. *f*, The part where the Bones of the Noſe were faſtened. *g g*, The upper part of the Orbits of the Eyes. *h h*, The two Holes for the Nerves that paſs into the Muſcles of the Eye-brows and the Frontal Muſcle. The Meaſure round the Ambit of the *Coronal* Suture in this Bone from *a*, to *e*, was about 21 Inches; from *c*, where the Sagittal and Coronal Sutures meet, to *f*, where the Bones of the Noſe are faſtened, 9 Inches and one 10th of an Inch; *b*, from drawing a tranſverſe Line acroſs the Forehead to *d*, 12 $\frac{2}{10}$ Inches, the thickneſs of the Bone, from one Table to t'other, about $\frac{1}{2}$ an Inch. *Fig.* 2.

Fig. 3. *Figure* 3. Shews the inſide of the ſame *Gigantick* Bone, drawn likewiſe in the ſame Proportion. *k k*, The thickneſs of the Bone. *l*, The ſharp and high Proceſs of the *Os cribroſum*, called by Anatomiſts *Criſta Galli*.

By comparing theſe Figures, 'tis evident, what an exact Conformity there is in all particulars between this large Bone and the like Bone in a Man of a juſt height; and that they no ways differ but in Magnitude. 'Tis alſo evident, that all the next immediately adjoyning Bones, which near make up the entire Head, muſt neceſſarily have been as well ſhaped, and of the ſame proportion with this Bone; otherwiſe they could not poſſibly cohere, ſo as to adapt themſelves cloſely to one another, and make an entire Globoſe Scull. Whence it muſt follow, that the Man, to whom it belong'd, was more than twice the height that Men uſually are, according to the common Courſe of Nature; that is, more than 11 or 12 Foot high.

It cannot reaſonably be ſuppoſed, that a Man of an ordinary Size could have had ſuch an exceeding large Head; for I conceive, he could not poſſibly ſubſiſt, whilſt ſo ponderous and exceſſive a Maſs of Bone as this Scull, with all that ſuper-abundant quantity of Brain requiſite to fill its ſpacious Cavity, was growing: much leſs continue ſo long alive, as to come to Maturity of Years, or Adult and full Manhood; to which, we are ſure, this Perſon muſt have attained, by the great Thickneſs and Solidity of this Bone, as well as its large Size. And tho' ſometimes from Obſtructions, or other Morbifick Cauſes, our Glands and ſofter *Viſcera* are ſo unequally nouriſhed, as to grow to an immenſe Size, yet ſuch a Præternatural exceſs of Growth in a hard and Bony Part, I don't think, has ever yet been obſerved.

'Tis true, Infants far gone in the *Rickets* are frequently obſerved to have great Heads in proportion to their ſmall emaciated Bodies, and that young Children are alſo liable to the *Hydrocephalus* or *Dropſy* in the Head, which ſometimes ſo dilates it, as to ſwell their Scull to a more immenſe Size. But neither of theſe Diſorders (for I take the Cauſe to be much the ſame in both Caſes, only differing in Degree) otherwiſe affect the Head, than by a Præternatural Collection of ſerous Humours incloſed in the Brain, they extend the yielding Sides of the weak and tender Scull, but do not in the leaſt increaſe its Bony Subſtance; nay, on the contrary, they rather diminiſh it; for 'tis always obſerved, that they reduce it to a more than uſual thinneſs, and ſometimes, as I have ſeen my ſelf, to be no thicker than an Egg-ſhell or Parchment. Nor can ſuch Diſtempers poſſibly affect thoſe of Adult Ages, ſo as to enlarge their Sculls; Becauſe all the Bones by that time are become ſolid and firmly knit together, ſo as to be no way capable of further Growth or Extenſion: And hence it is, thoſe Maladies are incident to Children, and them only, whilſt their Sculls are ſoft, pliable, and truly Membranous, rather than Bony. And daily Experience aſſures us, that unleſs ſuch Diſeaſes be timely removed, either by the Phyſician's or Chirurgeon's Art, or overcome ſo early by the ſtrength of Nature, as the Children have time enough to out-grow this Diſproportion in their Heads, by the bulk of their Body coming up to it, ere it ariſe to too exorbitant a degree of Magnitude; they all die in their Infancy, and their unſhapely Sculls are eaſily diſtinguiſh'd

from

from all others, by the large Fontanell, or Open in the Mole of the Head, that remains Membranous, and never becomes, like the reſt of the Scull, a Bony Subſtance. And that they cannot poſſibly arrive at Manhood is plain; for this Monſtrous and unequal Growth, or rather ſwelling of their Heads, meeting with no Check, but ſtill every Day increaſing upon them, when it arrives to ſuch a certain Degree, that its extravagant Dimenſions become irreconcileable with the Natural Functions of the Body, the *Oeconomia Animalis* muſt inevitably ſink under the Preſſure of ſo great a Load, and the whole Machine tend to its Diſſolution, as not being able to bear any longer with ſo highly Morbid a Diſpoſition, in ſo principal, and ſo extreamly neceſſary a part to Life as the Brain, the fountain of all Spirit, Senſe, and Motion.

I ſhall not deny, but by one Accident or other, ſome Diſproportion between the Head and the reſt of the Body, in ſuch as are grown up to the compleat Stature of Man, does ſometimes happen. But a Diſproportion of this kind, however remarkable to the Eye and unſeemly, is never ſo extraordinary as to be very conſiderable in it's ſelf. For I find the Circumference of a Man's Head of a moderate, that is the moſt common Size, is uſually about 22 Inches, and if we chance to ſee one of 25 or 26 on a Man of Ordinary Height, which certainly is very rare, it appears large and remarkable; but ſhould there be found a head ſtill bigger, ſo as to be 28 or 29 Inches in Ambit, (which I am apt to think, for the Reaſons above mentioned, has ſcarce or ever happened, unleſs where the Proportion of the other parts of the Body were ſuch as neceſſarily required it) ſuch a one, I ſay, would be really wonderful, and counted Monſtrous. Yet the Circumference of the Head, of which this large Fore-head Bone was a part, ſo far exceeded the largeſt of theſe Meaſures, that, as I computed it's Dimenſions, when 'twas entire and covered with the Hairy Scalp, it was about 44 Inches round; and therefore muſt have had a Body belonging to it, that bore a proper Conformity to this its ſpacious Circumference.

Nor do I apprehend ſo great a Stature as this in a Humane Body, tho' it be indeed extraordinary, any way abſurd or repugnant to the Courſe of Nature; but rather, if duely weighed, very conformable to a certain Anomalous Method, if I may ſo call it, that ſhe apparently affects in the producing moſt of her Works. Thus we cannot but obſerve in the Vegetable Kingdom, that ſome are of the Dwarf kind, while others ariſe to ſo ſtupendious a Growth, that they more than double the Bulk even of ſuch as are eſteem'd large in the ſame Tribe. Several Examples of ſuch like Gigantick Oaks, and other ſorts of exceeding vaſt Trees, may be ſeen Regiſtred by Mr. *Evelyn*. Sylva, c. 30. And amongſt Animals, if we compare that little low Race of Horſes from the *Iſle of Man*, uſually call'd *Manks* Horſes, to that large Breed they have in *Northamptonſhire* in *England*, or in the *Biſhoprick* of *Leige* in *Flanders*, we may properly enough eſteem theſe in compariſon with thoſe, a ſort of Gigantick Horſes. Or, if the *Iriſh Wolf-Dog*, which is of the Grey-Hound kind, and of ſo beautiful and large a Make, that for its curious Form, as well as goodly Size, it far ſurpaſſes all other Dogs of the Creation, be compared to

a common Grey-Hound, it appears truly of a Gigantick Breed; And we may further add concerning it, As the Giant's Stock of old is extinct, at leaſt in theſe Countries, ſo this Gigantick Dog is now ſo rare, that in a few Generations more, I doubt not but 'twill be quite loſt in theſe Parts, and the Species periſh, for ought I know, off the Face of the Earth.

And that Nature takes the ſame uncertain Meaſures in the Generation of Mankind, I think, is not leſs apparent. Thus the *Laplanders* are a Nation remarkable for their low Stature; and 'tis ſure, there are and have been in all Ages and Countries thoſe we call *Dwarfs*, and ſome of them of a moſt extraordinary ſmall Size of Body. The Duke of *Crequi*'s Famous Dwarf, as deſcrib'd by *Aldrovandus*, was not in height above 30 Inches; and the ſame Author ſpeaks of others ſtill ſhorter. Now ſince Natural Cauſes operate ſo as to produce Humane Creatures, partaking of all Properties common to their Kind, of ſo ſmall a Model as to fall ſhort even of half the common Standard of their Species, I cannot think it unreaſonable, ſuppoſing we had no other Authority for it, to imagine that the ſame Natural Cauſes may ſometimes act in t'other Extream likewiſe.

There is a manifeſt Alliance and Congruity obſervable in Nature, between the Stature of Man's Body, and his Age during the time of his Growth; whence the *Greeks* thought it not improper to expreſs both theſe by one and the ſame Word ἡλικία, which ſignifies promiſcuouſly Stature as well as Age. And as 5 ½ Feet may well be eſteem'd the moſt ſettled and ordinary degree of Height in a Man; ſo about 70 Years may juſtly be allowed the moſt common Period of his Age: yet daily Experience and Obſervation acquaint us with thoſe that vaſtly exceed theſe Limits, in both theſe Reſpects: and as we have certain Hiſtory that informs, That the Youngeſt of theſe, *Thomas Parr*, and *Henry Jenkins*, both of *England*, and the Old Counteſs of *Deſmond*, and Mrs. *Eckleſton*, both of *Ireland*, fully compleated double that uſual Term of Life; ſo we have no Reaſon to queſtion the Accounts given us of others, that have been found in Stature double the common Standard of Man. Nay, both theſe Properties, Longævity and High Stature, do ſo naturally reſult each from their proper Cauſes, that they are often obſerved to become Hereditary, and run in whole Families; whence the *Greeks* had their μακρόβιοι, and the *Romans* their *Celſi*; and in *Paleſtine* of old, they had their *Anakims*, or Sons of the Giants. So that Humane Gigantick Bodies are no way Inconſiſtent with the Courſe of Nature. And indeed, we have ſome clear Teſtimonies given us by Authors of unqueſtionable Credit and Veracity, that there actually have been Men in the World, and likely ſtill are, of ſo large a Bulk, and ſo high a Stature of Body, as properly to deſerve the Name of Giants. *Edmund Malone*, when he ſtood on the bare Ground with his Shoes off, meaſured full 7 Foot 7 Inches in Height; *Walter Parſons*, King *James* I's Porter, born in *Staffordſhire*, was much of the ſame Stature. In *Flanders* and *Germany*, where Men are uſually of a larger Size, and their Bodies of a groſſer Make than with us, we meet with Examples that have been much Taller. *Isbrand Diemerbroeck* tells us, he ſaw himſelf at *Utrecht*, in the Year 1665, a Man 8 Foot and a half high, all his Limbs well-ſhaped, and his Strength proportionable

Vid. Sup. Sect. I.

Anat. c. 1. lib. 1.

onable to his Height: He was Born at *Schoonhoven* in *Holland*, of Parents of an ordinary Stature; and Mr. *Ray* mentions, That he saw this very Man at *Bruges* in *Flanders*. *Jo. Goropius Becanus* says, he saw a Youth almost 9 Foot high, a Man near 10 Foot, and a Woman that was quite 10 Foot in height. *Pliny* the Naturalist speaks of several Men in his Age, much of the same Height, or something Taller, than those mentioned by *Becanus*. And it is not improbable, that where both the Soil and Climate concur, and are Naturally disposed to produce Plants, Fruits, and several Kind of Animals, of a much larger Bulk than any our Countries afford, such as the Ostridges and Cunters among Birds; the largest Crocodiles, the Moose Deer, the Elephant, the Rhinoceros, the Hippopotamus, *&c.* among Quadrupeds; In those Parts of the World, I say, where such like vast Creatures are met with, 'tis not unlikely that humane Animals may also be sometimes found of a much greater Size than any here among us. Thus *Andreas Thevet*, the Famous Voyager, tells us, That being himself on the Coast of *Africk*, in the Territory of *Arguin*, for 3 Weeks together, he chanced to meet with a Rich *Spanish* Merchant, who had some while before suffered Shipwrack there by a Storm, yet had luckily sav'd a Coffer, wherein he had carefully preserv'd the Scull and Bones of an *American* Giant, he had brought along with him from that Country; who was 11 Foot and 5 Inches in Height, and Dy'd in the Year 1559. These Bones he shewed to M. *Thevet*, who was so curious, that he took the Measures of the most principal of them, as follows; The Bones of the Legs measured full 3 Foot 4 Inches in length, and the Scull was 3 Foot 1 Inch about. Which Circumference, I observe, is exactly proportionable to the length of the Legs, and if we make an allowance for the Hair and Skin that covered the Scull when he was alive, it falls very little short of the Dimensions we have before set down, in computing the Size of our Giant's Head when it was entire.

Travails.

Origen. Antwerp. p. 207, 212.

Nat. Hist. l. 7. c. 16.

Descript. of America, l. 27, c. 1.

And this brings into my Thoughts, as if it were not unlikely, that this large *Os Frontis* we have describ'd, might about 70 or 80 Years ago (for it seems fresh, and is still solid and ponderous, so that it cannot be very old) have been brought into *Europe* by some of the Trading *Hollanders*, as a proper Sample of some huge Gigantick Man, met with in some of their Voyages into *America*. But this is only Conjecture; and indeed, it does not import much whether we discover the true Original of it or no.

From these Warrantable Histories, and this Particular Bone before us as a fair Specimen, we may clearly deduce, that there have been in Nature Humane Bodies 11 and 12 Foot high; which equals, if not surpasses the Stature of the Tallest Giant mentioned in *Holy Writ*. For the Height of *Goliah* of *Gath* is said expresly to be but 6 *Cubits and a Span*; and taking a *Cubit*, in the most vulgar and usual Acceptation, for a Foot and a half, his Stature will not amount to above 9 Foot 9 Inches. Indeed we may reasonably conclude, that *Og* the King of *Basan* must have considerably exceeded *Goliah* in Height, if we make an estimate of his Stature by the Dimensions which are given of his Bed-stead, which is said to have been kept as a Memorial of him at *Rabbath of the Children of Ammon*, and to have been 9 *Cubits in length*; but

1 Sam. 17. 4.

Deut. 3. 11.

but then we cannot imagine, but that his Bed muſt of neceſſity have been much longer than his Body; and the leaſt allowance we can make for the Overplus, is the ſpace of 9 Inches above his Head, and as much below his Feet: and if we make this Deduction, 'twill follow he was not above 12 Foot high; much of the ſame Standard with this our Giant, whoſe Forehead Bone is ſtill kept in the *Medicine-School* at *Leyden*.

A Man of a ſtrange Imitating Nature; by Dr. Geo. Garden. n. 234. p. 842.

III. At *Strachbogie*, not far from *Aberdeen*, there is a Man who hath ſomething peculiar in his Temper, that inclines him to imitate unawares, all the Geſtures and Motions of thoſe with whom he converſeth. His Name is *Donald Monro*; he is a little, old, and very plain Man, of a thin ſlender Body; he hath been ſubject to this Infirmity, as he told us, from his very Infancy. He is very loath to have it obſerved, and therefore caſts down his Eyes when he walks in the Streets, and turns them aſide when he is in Company. We had made ſeveral Trials before he perceived our Deſign; and afterward had much ado to make him ſtay. We Careſs'd him as much as we could, and had then the opportunity to obſerve, that he Imitated not only the ſcratching of the Head, but alſo the wringing of the Hands, wiping of the Noſe, ſtretching forth of the Arms, *&c.* And we needed not ſtrain Complement to perſwade him to be covered; for he ſtill put off and on as he ſaw us do; and all this with ſo much exactneſs, and yet with ſuch a natural and unaffected Air, that we could not ſo much as ſuſpect he did it on Deſign. When we held both his Hands, and cauſed another to make ſuch Motions, he preſſed to get free; but when we would have known more particularly, how he found himſelf affected, he could only give us this ſimple Anſwer, That it vexed his Heart and his Brain.

A Negro Boy dappled with white Spots; by Mr. Will. Byrd. n. 235. p. 781.

IV. Capt. *Cha. Wager* has a *Negro-Boy*, about 11 Years old, who was born in the Upper-parts of *Rappahanock* River in *Virginia*: his Father and Mother were both perfect Negroes. This Boy, till he came to be 3 Years old, was in all Reſpects like other Black Children, and then without having any Diſtemper began to have ſeveral little white Specks in his Neck and upon his Breaſt, which with his Age, have ſince been obſerved to increaſe continually very much, both in number and bigneſs; ſo that now, from the upper part of his Neck (where ſome of his Wool is already turned White) down to his Knees, he is every where dappled with white Spots, ſome of which are broader than the Palm of a Man's Hand, and others of a ſmaller proportion. The Spots are wonderfully White, at leaſt equal to the Skin of the Faireſt Lady, and are not liable to be Tan'd: But they are, I think, of a paler White, and do not ſhew Fleſh and Blood ſo lively through them as the Skin of White People; but poſſibly the Reaſon of that may be, becauſe the Skin of a Negro is much thicker. His Face, Arms, and Legs, are perfectly Black: He has all along been very Sprightly and Active, and has more Ingenuity too, than is common to that Generation.

Phyſiognomy; by Dr. Gwither. n. 210. p. 118.

V. Soft Wax cannot receive more numerous and various Impreſſions, than are imprinted on Man's Face by Objects moving his Affections: And not only the Objects themſelves have this Power, but alſo the very Images or Idea's; that is to ſay, any thing that puts the Animal Spirits into the ſame Motion

Motion that the Object preſent did, will have the ſame effect with the Object. To prove the firſt, Let one obſerve a Man's Face looking on a pitiful Object, then a Ridiculous, then a Strange, then on a Terrible or Dangerous Object, and ſo forth: For the ſecond, that Ideas have the ſame effect with the Object, Dreams confirm too often.

The manner I conceive to be thus; the Animal Spirits moved in the Senſory by an Object, continue their motion to the Brain, whence the motion is propagated to this or that particular Part of the Body, as is moſt ſuitable to the Deſign of its Creation, having firſt made an alteration in the Face by its Nerves, eſpecially the *Pathetick*, and *Oculorum Motorii*, actuating its many Muſcles, as the Dial-plate to that ſtupendious Piece of Clock-work, which ſhews what is to be expected next from the ſtriking Part: Not that I think the Motion of the Spirits in the Senſory continued by the Impreſſion of the Object all the way, as from a Finger to the Foot; I know it too weak, though the Tenſeneſs of the Nerves favours it: But I conceive it done in the Medulla of the Brain, where is the common Stock of Spirits; as in an Organ, whoſe Pipes being uncovered, the Air ruſhes into them, but the Keys let go, are ſtopt again: Now if by repeated Acts or frequent entertaining of the Idea's of a Favourite Paſſion or Vice, which Natural Temperament has hurry'd one to, or Cuſtom dragg'd, the Face is ſo often put into that Poſture which attends ſuch Acts, that the Animal Spirits find ſuch patent Paſſages into its Nerves, that it is ſometimes unalterably ſet, (as the *Indian Religious* are, by long continuing in ſtrange Poſtures in their *Pagods*,) but moſt commonly ſuch a Habit is contracted, that it falls inſenſibly into that Poſture, when ſome preſent Object does not obliterate that more Natural Impreſſion by a New, or Diſſimulation hide it. Hence it is, that we ſee great Drinkers with Eyes generally ſet towards the Noſe, the Adducent Muſcles being often employed to let them ſee their lov'd Liquor in the Glaſs in the time of Drinking, which were therefore called Bibitory; Laſcivious Perſons are remarkable for the *Oculorum Mobilis petulantia*, as *Petronius* calls it. From this alſo we may ſolve the *Quaker*'s Expecting Face, waiting the pretended Spirit, and the Melancholly Face of the Sectaries; the Studious Face of Men of great Application of Mind; Revengeful and Bloody Men, like Executioners in the Act; and though Silence in a ſort may a while paſs for Wiſdom, yet ſooner or later *Sir Martin* peeps thorough the Diſguiſe to undo all; a Changeable Face, I have obſerved to ſhew a Changeable Mind. But I would by no means have what has been ſaid underſtood as without Exception; for I doubt not, but ſometimes there are found Men with Great and Vertuous Souls under very unpromiſing Outſides.

VI. By *Pores*, Phyſicians mean no more, than certain permeable ſpaces between the parts of a Body. Wherefore that there are Pores in the Skin of every Man's Body, is no more to be queſtion'd, than whether Men do ever Sweat or Perſpire. But in the Hands and Feet, theſe Pores are very remarkable. For if one will with an indifferent Glaſs, ſurvey the Palm of his

The Pores in the Skin; by Dr. Neh. Grew. n. 159. p. 566.

Hand very well waſhed with a Ball, he may perceive innúmerable little Ridges, of equal bigneſs and diſtance, and every where running Parallel one with another; and eſpecially upon the Ends and firſt Joynts of the Fingers and Thumb, upon the top of the Ball, and near the root of the Thumb
Fig. 4. a little above the Wriſt. In all which places, they are very regularly diſpoſed into *Spherical* Triangles, and Ellipticks. Upon theſe Ridges ſtand the Pores, all in even Rows, and of that Magnitude, as to be viſible to a very good Eye without a Glaſs. But being viewed with one, every Pore
Fig. 5. looks like a little Fountain, and the Sweat may be ſeen to ſtand therein, as clear as Rock-water, and as often as it is wiped off, to ſpring up within them again. That which Nature intends in the poſition of theſe Ridges is, That they may the better ſuit with the Uſe and Motion of the Hand: thoſe of the lower ſide of every Triangle, to the Bending in or Clutching of the Fingers; and thoſe of the other two ſides, and of the Ellipticks, to the Preſſure of the Hand or Fingers Ends againſt any Body, requiring them to yield to the Right and Left. And the Pores are placed upon theſe Ridges, and not in the Furrows which lie between them, that ſo their Structure might be the more ſturdy, and leſs liable to be depraved by Compreſſion; whereby only the Furrows are dilated or contracted, the Ridges conſtantly maintaining themſelves, and ſo the Pores unaltered. And for the ſame Reaſon, the Pores are alſo very large, that they may ſtill be the better preſerved, tho' the Skin be never ſo much compreſſed and condenſed, by the conſtant uſe and labour of the Hand; and ſo thoſe of the Feet, notwithſtanding the Compreſſion of the Skin by the Weight of the whole Body.

Theſe Pores are a very convenient and open Paſſage for the diſcharge of the more noxious and perſpirable parts of the Blood: which by the continual uſe of the Hands and Feet, are plentifully brought into them. Whence it is, that many Hypochondriacal Men, and Hyſterical Women, have almoſt a continual Burning in the Soles of their Feet, and the Palms of their Hands: Yet not on the top of their Feet or back of their Hands; which being leſs diſpoſed to receive the noxious parts, are therefore unfurniſht with this kind of Pores.

The Pores of the Skin wholly obſtructed by Nocturnal Air; by ---n. 8. p. 138.

VII. Not many Years ſince, there was in this Country *(near Leyden)* a Student, who being much addicted to the Study of Aſtronomy, and ſpending very many Nights in Star-gazing, had, by the Nocturnal wet and cold Temper of the Air, in ſuch a manner obſtructed the Pores of his Skin, that little or nothing exhaled from his Body; which appeared hence, becauſe that the Shirt, he had worn 5 or 6 Weeks, was then as white, as if he had worn it but one Day. In the mean while he gathered a Subcutaneous Water, of which yet he was afterwards well cured.

The great Effects of Touch, and Friction; by --- n. 12. p. 206. Hiſt. of Life and Death. 6. Sect. 3.

VIII. 1. My Lord *Verulam* obſerves, that Motion and Warmth (of which two Friction conſiſts) draw forth into the Parts new Juice and Vigor, and conduce much to Longevity. And Mr. *Boyle* obſerves, how in our Stables a Horſe well Curry'd is half Fed; and how ſome can tell by the Milk of their

Aſſes

Aſſes, whether that Day they have been well Curry'd or not; Arguing hence, That if in Milk the alteration is ſo conſiderable, it ſhould be ſo likewiſe in the Blood, or other Juices, of which the Blood is elaborated, and conſequently in divers of the principal Parts of the Body. To theſe Obſervations may be added what Dr. *Beal* not long ſince Communicated. 1. That he could make good Proof of the Curing or Killing a very great and dangerous Wen (that had been very troubleſome for 2 or 3 Years) by the Application of a Dead Man's Hand, whence the Patient felt ſuch a cold ſtream paſs to the Heart, that it did almoſt cauſe in him a Fit of Swouning. 2. That upon his Brother's Knowledge, a certain Cook in a Noble Family, being reproached for the uglineſs of his Warty Hands, was bid by his Lord to rub his Hand with that of a Dead Man; and that his Lord dying ſoon after, the Cook made uſe both of his Lord's Advice and Hand, and ſpeedily found good effect. 3. That a Gentleman, who came lately out of *Ireland*, inform'd him of an Aged Knight there, who having great Pain in his Feet, inſomuch that he was unable to uſe them, ſuffered a loving Spaniel to lick his Feet Mornings and Evenings, till he found the Pain appeaſed, and the uſe of his Feet reſtor'd. This, ſaith the Relator, was a gentle Touch, and Tranſpiration; for he found the Spirits tranſpire with a pleaſing kind of Titillation. 4. That he can aſſure of an Honeſt Blackſmith, who cauſed Vomitings by ſtroaking the Stomach; gave the Stooll by ſtroaking the Belly; appeaſed the Gout and other Pains, by ſtroaking the Parts affected.

Uſefuln. of Exper. Phil. c. 15. ſect. 2.

2. 'Tis near 20 Years ſince I ſaw Mr. *Greatrix* Stroak any: But I give you nothing here, which ſeveral Friends, who were Eye-witneſſes, as well as my ſelf, do not remember, and think exactly true.

Cures done by Mr. Greatrix the Stroker, by M. M.; Communicated, by Mr. Thoresby. n. 256. p. 332.

My own Brother, *John D——n* was ſeized with a violent Pain in his Head and Back; Mr. *Greatrix* (coming by Accident to our Houſe) gave preſent Eaſe to his Head by only ſtroaking it with his Hands. He then fell to rub his Back, which he moſt complained of, but the Pain immediately fled from his Hand to his Right Thigh, then he purſued it with his Hand to his Knee, from thence to his Leg, Ancle and Foot, and at laſt to his great Toe. As it fell lower, it grew more violent, and when in his Toe it made him roar out, but upon rubbing it there, it vaniſh'd.

My Uncle's Daughter was ſeiz'd, when a Girl, with a great Pain and Weakneſs in her Knees, which occaſion'd a white Swelling; this followed her for ſeveral Years, and having uſed divers Means to no effect, after 6 or 7 Years time, Mr. *Greatrix* coming to *Dublin*, and Lodging at my Father's, my Aunt brought her to him. He ſtroak'd both her Knees, and gave her preſent Eaſe, the Pain flying downwards from his Hand, till he drove it out of her Toes, and the Swelling in a ſhort time wore away and never troubled her after.

I had alſo a Comrade, who, after a Fever, was much troubled with a Pain in her Ears, and very Deaf; Mr. *Greatrix* put ſome of his Spittle into her Ears, and turning his Finger in her Ears rubbed and chafed them well, which cured her both of the Pain and Deafneſs: And an oppoſite Neighbour tells me, That her Uncle was Cured by him of the ſame Malady. Another

told me, That when a Child, being extreamly troubled with the Kings-Evil, ſhe was Touch'd by King *Charles* II. but ſhe was nothing the better; but Mr. *Greatrix* perfectly Cured her. A Smith near us had two Daughters extreamly troubled with the Evil, the one in the Thigh, and the other in the Arm; he cured them both: One of them lives ſtill here; ſhe is a Healthy Woman, and the Mother of ſeveral Children. The Scars of the Evil Sores ſtill remain on her Arms, tho' it is 20 Years ſince it was cured; ſince when ſhe never had any Symptoms of it.

Where Mr. *Greatrix* Stroakt for Pains, he uſed nothing but his dry Hand; if Ulcers or running Sores, he would uſe Spittle on his Hand or Finger; and for the Evil, if they came to him before it was broke, he Stroak'd it, and order'd them to Poulteſs it with boil'd Turneps, and ſo did every Day till it grew fit for Lancing, he then Lanc'd it, and with his Fingers would ſqueeze out the Cores and Corruption, and then in a few Days it would be well with only his Stroaking of it every Morning; but if it were broke before he ſaw them, he only ſqueezed out the Core, and healed it by Stroaking. Such as were troubled with Fits of the Mother, he would preſently take off the Fit, by only laying his Glove on their Head; but I never knew any that he cured of that Diſtemper, for their Fits would return; but I have heard he cured many of the Falling Sickneſs, if they ſtayed with him, ſo that he might ſee them in 3 or 4 Fits, elſe he could not Cure them.

A Girle in Ireland with Horny Excreſcencies; by Mr. St. Geo. Aſh. n. 176. p. 1202.

IX. 1. This Horny Girl is called *Anne Jackſon*, born in *Waterford* of *Engliſh* Parents, who are both ſaid to have been ſound and healthy; this Infirmity did not ſhew it ſelf, till ſhe was about 3 Years old. She is now about 13 or 14 Years of Age, yet can ſcarce go, and is ſo little in Stature, that I have ſeen Children of 5 Years old taller; ſhe is very ſilly, ſpeaks but little and that not plainly, haſtily and with difficulty, her Voice is low and rough; her Complexion and Face well enough, except her Eyes, which look very dead, and ſeem to have a Film or Horn growing over them, ſo that ſhe can hardly now perceive the difference of Colours. The Horns abound chiefly about the Joynts and Flexures, and not on the brawny Fleſhy Parts of her Body; they are faſtened to the Skin like Warts, and about the Roots reſemble them much in Subſtance, tho' toward the Extremities they grow much harder and more Horny; at the end of each Finger and Toe, grows one as long as the Finger or Toe, not ſtrait forwards, but riſing a little between the Nail and the Fleſh (for near the Roots of theſe Excreſcencies is ſomething like a Nail) and bending again like a Turky's Claw, which too it much reſembles in Colour; on the other Joynts of her Fingers and Toes are ſmaller ones, which ſometimes fall off, others growing in their places. The whole Skin of her Feet, Legs, and Arms, is very hard and Callous, and does daily grow more and more ſo; on her Knees and Elbows, and round about the Joynts, are many Horns; two more remarkable at the Point of each Elbow, which twiſt like Rams-Horns, that on the Left Arm is above $\frac{1}{2}$ Inch broad, and 4 Inches long; on her Buttocks grow a great number, which are flat by frequent ſitting; at her Arm-pits and the Nip-

Nipples of her Breasts, small hard Substances shoot out, much slenderer and whiter than the rest; at each Ear also grows a Horn; the Skin of her Neck does of late begin to turn Callous and Horny, like that of her Hands and Feet. She Eats and Drinks heartily, Sleeps soundly, and performs all the Offices of Nature, like other healthy People, except that she never had the Evacuation proper to her Sex.

A Boy in France *with Horny Excrescencies; by* Mr. Locke. *n.* 230. *p.* 594.

2. In *May* 1678, at the Hospital at *Paris* call'd *La Charité*, I saw a Young Lad of *Brie* between 19 and 20 Years Old, who had upon the Ends of all his Fingers, as it were Horns grew out; one whereof, upon the middle Finger of his Right-hand, was 310 *Grys* long, and 130 *Grys* circumference. He told me, he had one formerly on his Thumb, much bigger and longer than this, but it was now very short. The like grew also upon the Toes of his Feet, only excepting the two small Toes of each Foot, where there were now none, and upon 3 of them there never had been; upon the 4th there had been one, but it having fallen off about 6 Months since, came no more, but left the Nail very little different from Natural. This Horny Substance grew not out of the End of the Fingers, but was as it were a thickning of the Nail, which instead of growing out in length increased in thickness; but rose not up straight in a Perpendicular Line to the Finger, but as it augmented bended forwards, and so grew somewhat into the shape of a Bird's Claw, but that it was not taper and sharp like that, but blunt at the end, and almost of the same bigness all along, and full of pretty deep Chaps in the Convex part, but the Concave was without any. He had no sense in the Horny Part it self, but that Part where it Joyns to the Flesh is very sensible and tender. There are also in several parts of the back of his Hands Horny Excrescencies, some pretty broad, and others less, but none rising much above the Skin; but they look there, those that are broad, like flat but very broad Warts; but to the Touch they feel much harder.

This Disease began about 3 Years before, after having had the Small-Pox. His Food was the usual Food of the Country. He has been purged twice since he came into the *Charité*; and some of the Horns of his Fingers begin to loosen at the Roots.

N. B. A *Gry* is the one thousandth part of a *Philosophical Foot*, which is the 3d part of a Pendulum of Seconds; So that 310 *Grys* is a little more than 4 *English* Inches.

A Body, after being long buried, almost wholy converted into Hair; by ----- Ph. Col. *n.* 2. *p.* 10.

X. 1. About 43 Years since, the Body of a Woman was buried here (at *Norimbergh*) in a Coffin of Wood, painted (according to the Custom here used) with Black. The Earth in which it was buried was dry and yellow, as the Earth for the most part is near this City round about. The Corps lay the lowest of three in the same Grave, there being two other Corps over it. Through the Clefts of the Coffin, much Hair was thrust out, and had grown very plentifully, insomuch that 'tis believed that the whole Coffin may for some time have been all covered with *Hair*. The Cover of this Coffin being removed, the whole Corps appeared perfectly resembling an Human Shape, exhibiting the Eyes, Nose, Mouth, Ears, and all the other

Parts

Parts; but from the very Crown of the Head to the Sole of the Foot, covered over with a very thick set *Hair*, long and much curl'd. The Sexton, after a little viewing of it, going to handle the upper part of the Head with his Fingers, found immediately all the Shape of the Body to fall, and left nothing in his Hand but a Handful of *Hair*; there being neither Skull, nor any other Bone left, unless it were a very small part of that which he suspected to be the great Toe of the Right Foot. This *Hair* was somewhat rough at first, but afterwards it grew very much harder, and of a Brown Red Colour.

By M. Chr. Arnold. *ib. p.* 50.

2. Besides the Relation of M. *Wulferus*, concerning the *Hairy Corps* here lately discovered, it hath likewise been observed, that one Executed and Hanged at this Town for Theft, within some space of time, was strangely overgrown with *Hair* all his Body over upon the Gallows.

Observations of Hair found in several parts of the Body; by Dr. Edw. Tyson. Ph. Col. *n.* 2. *p.* 11.

3. 'Tis the Opinion of the Learn'd *Honoratus Fabri*, * and others, that Hair, Wool, Feathers, Nails, Horns, Teeth, *&c.* are but Animal Vegetables or Plants; if so, we may be the less surpriz'd at their growth on the Body, even after the Decease of the Animal: And as there have been other Examples, so the fore-going Observation is a remarkable Instance thereof. *Petrus Borellus* † thinks, that as Plants, they may be transplanted, and made to grow in a Soil they did not at first; and some Remarks he gives thereon. What he relates concerning Teeth being drawn and set again, I know to be true, having tried it formerly in my self, and have heard of the like done by others.

* *Lib.* 3. *de Plantis.*

† *Hist. & Obs. Med. Cent.* 1. *Obs.* 10.

As for *Hair*, though the outward surface of the Body be the usual place where it grows, yet hath it been sometimes found on the Tongue, upon and in Heart, in the Breasts, and Kidneys, and other Glandulous and Muscular parts of the Body: But there is scarce any inward part more subject to it than the *Ovarium*, or Testicles of Females. I have lately met with 3 Instances of it; an account of which may possibly gratifie the Curious.

The first was in a Bitch I dissected in my Chamber at *Oxford*, *An.* 1674. where I observed the *Omentum* larger than usual, but so fasten'd to the *Intestines*, the extreams of the *Cornua Uteri*, and to the Right-side, that I could not readily separate it. Where the Adhesion was it was somewhat enflam'd, and had there several small Glands. But I very much wondred to find here *Hair* growing, some on the *Omentum*, others on the *Cornua Uteri*, others in the *Ovarium*; several of them did lie loose in the Veins, and two or three I found in the right *Ventricle* of the *Heart*; others were rooted in small Glands. The *Cornua Uteri*, at their extreams were joyned together; and both *Testicles* made but one large rude *Glandule*. It had several Sinous Cavities within, filled with a purulent Matter and *Hair*. In the *Cornua Uteri* were the *Vestigia*, or Tracts of former *Foetus's*. Before Dissection, I observed the fore-parts of the Bitch to be well, but the hinder were much emaciated. This *Hair* was about an Inch, or an Inch and an half long; and although found in so many places, yet not much in all. It resembled somewhat some of the *Hair* of the Skin.

My

My next Obſervation, was in a Young Gentlewoman I was at the Diſſecting of, together with Dr. *Morton*, Dr. *Dan. Cox*, &c. in *Nov.* 1679. Where, beſides ſeveral other particulars we did obſerve that may more nearly relate to the Cauſe of her Death and lingring Illneſs, we obſerved an unuſual Tumor of the right *Teſticle* or *Ovarium*, which was ſwelled into two Veſicles or Bags, almoſt as big as a Man's Head; one of theſe was much leſs than the other; both conſiſted of a thin Membrane, and had a free communication on the inſide one with another; they were filled with a Liquor and Subſtance much reſembling Curds and Whey; for in a thin pale *Lympha* or *Serum*, there did ſwim in ſeveral lumps and Pieces a *Steatomatous* or cruddy Matter, which to the Touch was ſoft and fatty, of a dilute yellowiſh Colour, and of no ill or remarkable Smell. Some of it being put into warm Water did in part diſſolve. The inſide of theſe Bags was ſmooth, and without the adheſion of this Matter, and in no place as we obſerved diſcoloured. One of theſe lumps or pieces was half as big as a Man's Fiſt, and in it we found a great deal of *Hair*, as likewiſe in the other pieces, but not in ſo great plenty. This *Hair* was of a Silver colour, very ſoft and fine, but ſtrong; and ſome of it 2 Foot and 3 Inches long. It did not ſeem to grow, or to be faſtened to any part, but to lye entangled in this cruddy Matter. By keeping, this *Hair* is grown ſomething browner, and by often handling, and by freeing it from that cruddy or fatty Subſtance, much of it broken ſhorter. But on the outſide of the larger Bladder or Bag, we met with the remaining part of the *Ovarium* or *Teſticle*, and in it we obſerved ſeveral Eggs, or at leaſt *Hydatides*, of this [o o] bigneſs. But we were more ſurpriz'd to find there a Bony Subſtance, which ſo exactly repreſented an Eye or Dog-tooth in its ſhape, hardneſs, colour, and all things, that I cannot better liken it to any thing beſides. It firmly adhered at its Baſis, where 'tis broadeſt, to the Membranes of the *Ovarium*, and had of each ſide of it (at ſmall diſtances) two other Bones or Teeth, but they were but ſmall, and not of ſo regular a Figure.

This *Tooth* and *Hair* gave a Suſpicion to ſome, that poſſibly they might be the parts of a corrupted *Embryo*, but I rather think not; for if ſo, we ſhould have met with Bones, or at leaſt a purulent Matter; beſides, the Tooth was without the Cyſtis or Bag, in the *Ovarium*, the *Hair* within. I rather look upon it as a *Luſus Naturæ*, her endeavouring to form ſomething, and being diſappointed of an Animal, produced a Vegetable. Teeth and Bones at firſt are ſoft Membranes or Tendons hardening into Cartilages, and Cartilages into Bones. The Tendons of the Legs of Fowl, as of an old *Turkey*, become Bony; ſo have I ſeen the *Arteria Aorta*, part of the *Emulgent* and *Iliac* Branches of a Woman at *Oxford*, that were *Oſſeous*. Dr. *Willis* mentions the like of the *Carotid Artery*, and I have ſeen it alſo in the great Artery near the Heart in a Horſe, and 'tis often to be met with in the Hearts of Oxen and Deer. Once I obſerved the outward Membrane of the Liver in an Humane Body, that was part Schirrhous, part Bony; once I met with the ſame in the *Spleen*, and at another time (in an Ancient Gentleman) on the outſide of the *Lungs*. So that even here poſſibly, part of the

the *Ovarium* being as it were Callous or Schirrhous, it might *Offifie*, and ſome unknown Circumſtances might determine and ſhape it into a Tooth.

As for the *Hair* in the Bag or *Cyſtis*, I am apt to think, that that fatty Subſtance, in which it was contained, might contribute much towards it; as the Threads of Silk worms, the Cobwebs of Spiders, ſo Cotton, the Thrums of the *Gramen Tomentoſum*, &c. are from particular Juices. But here they have their ſtrainers through which they ſhoot, or are as it were wyre-drawn. The *Hair* mentioned in the fore-going Obſervation, was moſt of it radicated in ſmall Glands; but as for that of this, like as ſome Plants that thrive by ſending their Roots into a Fluid Body, the Water, this *Steatomatous* or fatty Subſtance might prove a ſufficient Soil for propagating and producing them; which I am the more apt to believe, ſince in the following, and ſome other parallel Hiſtories, where ſuch *Hair* hath been found, likewiſe this pinguious or fatty Subſtance hath alſo been obſerved.

Therefore my 3d. Obſervation is of a Gentlewoman, aged about 39 Years, who for a conſiderable time had been troubled with various Symptoms of the Stone in the *Kidneys*, as bloody Urine, great Pains, Vomitings, *&c.* which in all probability were the greateſt Cauſe of her Death. Upon opening her Body, there was obſerved near the *Uterus* a Cyſtis or Bag about the bigneſs of a large Turky's Egg, and in it a like fatty Subſtance, as before expreſſed, as alſo a great quantity of light ſoft *Hair*. Faſten'd to a fleſhy Subſtance within the Cyſtis was a *Bone*, in ſome ſort reſembling a *Mandible*: for it had ſeveral Sockets, in which were ſeated 3 large *Dentes Molares*, or Grinders, in a Triangle, and a 4th not yet quite grown out. In one of the Kidneys was found a large Stone.

How ſubject this Part is to ſuch *Hairy* Tumors, may further appear from the Hiſtories of others; but they make no mention of *Teeth* found there; but I have been acquainted, that the Learned Dr. *Needham*, Diſſecting a Woman here in Town ſome Years ago, in one of the *Ovariums*, which was very much ſwelled, found both a Tooth and Hair there.

An Obſervation conſonant to it, upon the Diſſecting a Morbid Body; by Dr. Sampſon Ph. Col. *n.* 2. *p.* 49.

4. In a Woman lately Diſſected, who was the Day before her Death with great difficulty delivered of a dead Child, there was found 2 great globoſe Tumours depending upon the Left *Teſticle*, and may rather be called preternaturally grown Eggs, or parts of the extended *Ovarium* : Both of them lay in the *Pelvis* under the Womb, and ſo hindred the Egreſs of the *Fœtus* which was well grown and big. They were covered with a thick Membrane, which had its Veins and Arteries as conſpicuous as thoſe are in the Urinary Bladder. That neareſt to the *Teſticle* was the leaſt, of the bigneſs of a Coco-nut, which had in it a fatty Subſtance, not fluid, of the colour of the yolk of an Egg, and in the midſt of it a Lock of *Hair*, which when it was freed from the Greaſe, appeared of a flaxen colour: The Fat it ſelf crackled in the Fire, melted and took Flame like Lard, and in a Spoon over a Candle would boyl and ſmoak, excepting ſome ſmall grumoſe Parts. In the midſt of the Membrane was a hard and knotty Subſtance, in which lay a ſmall Bone of a ſtrange ſhape, with a *Perioſtium* upon it, which was hard

hard to ſeparate from it. The Bone is hard, white, and ſomewhat bigger than the biggeſt of the Bones in the *Meatus Auditorius*.

The other Tumor was thrice as big as the former, and about 2 Inches diſtant from it, yet connected to it by a ſtrong Membrane of the extended *Tunicle*. Opening it, there ſprung out a more white and liquid ſort of Greaſe, but in the middle was as thick as the former, and of the Colour and Conſtitution of Live-Honey; for which cauſe it may be called a *Meliceris*, though the inflammability both of this and the other, makes them both *Steatomata*. In the midſt of this lay envelop'd a large lock or two of *Hair*, variouſly entangled like thoſe the Country-men call *Elfs-locks*, which are a Species of the *Plica Polonica*. The Colour was of a blackiſh Brown, and the quantity four times as much as the former. Some part of this *Hair* was long, and evidently grew out of the inward parts of the Membrane, in which it was radicated, and from whence it was plucked. This Fat was more inflammable than the other, neither did it crackle in burning as the former, and left fewer Spots in the Spoon. In the Duplicatures of this Membrane, alſo was a Lump which contained another miſhapen Bone, very hard and hollow, covered with a Skin like a *Perioſtium* without, and the *Dura Menynx* within: So that it is hard to ſay, whether Nature was forming a Tooth with part of the Jaw, or the whole *Cranium*.

XI. The *Parenchymous* Parts of the Body, are by Anatomiſts generally ſuppoſed to be in very many places wholly void of Veſſels, deſign'd chiefly to fill up Cavities and Interſtices between the Veſſels, and to bolſter up the ſame, and to convey them through the Parts.

The Parenchymous Parts of the Body, by Sir Edm. King. *n.* 18. *p.* 316.

But having many Years endeavoured to excarnate ſeveral Parts of the Body, *viz.* the *Liver*, *Lungs*, *Spleen*, *Kidneys*, &c. (not to name the *Placenta Uteri*, which ſeems to be *Parenchymous* too;) and being very deſirous to make a Scheme of the Veſſels of any of theſe, whatever they were, I fixt upon; I found, notwithſtanding all my Care to preſerve the Veſſels, when I was freeing them as heedfully as I could from the ſuppoſed *Parenchyma*, that in every breach I made either with my Fingers or otherwiſe, all my Endeavours were deſtructive to my Purpoſe: and that upon examination of thoſe Bits, much of which is called *Parenchyma*, I met in them more Veſſels than I had preſerved in the Parts whence they came: and though the Portion were never ſo ſmall, yet my bare Eye could make this diſcovery; much more could I, when aſſiſted by a Microſcope, perceive I had deſtroyed more Veſſels than preſerved, in deſpite of the exacteſt Care I was capable to uſe. Then reviewing what miſchief I had done in every place, quite through the whole Tract of my Fingers, Knife, *&c.* I began to think with my ſelf, That it was not impoſſible for theſe Parts to conſiſt wholly of Veſſels curiouſly wrought and interwoven (probably for more Uſes than is yet known;) and the Conſideration, which came into my Mind, of a piece of fine Cloth (which conſiſts of ſo many ſeveral minute Hairs call'd Wool) was no diſcouragement to this Opinion. I then reiterated Experiments over

and over; ſome of which proved ſo ſucceſsful, to my Apprehenſion, that I was encouraged in the Year 1663 and 1664, to diſcourſe of it to ſeveral very Worthy Perſons; as Mr. *Boyle*, Sir *Will. Petty*, Dr. *Williams*, Dr. *Lenthal*, Dr. *Jaſpar Needham*, Dr. *Samſon*, (who afterwards ſent me a Letter from *France*, intimating the Acquaintance he had made with the Learned *Steno*, who hath ſince Publiſhed ſomething of the ſame Diſcovery) Mr. *Daniel Cox* and Dr. *Sam. Parker*, &c. who doubtleſs cannot but remember, that then I related to them, I found much cauſe to believe, that that Subſtance commonly call'd *Parenchyma* was in moſt, if not in all its *Parenchymous* Parts, full of Veſſels; however it had been Imagined by all, I could ever meet with, to conſiſt in great part of a Subſtance, in many places void of Veſſels, deſign'd for ſuch Uſes, as are above-mentioned. Againſt which, I have now further to alledge; 1. That I obſerve in a piece of Muſculous Fleſh (ſo call'd) either Raw, Roaſted, or Boiled, *&c.* that if I ſo far extend it, as to make it to be ſeen through, I can (aſſiſting my Eye) perceive it full of Veſſels placed as thick as is poſſible to be imagined (the Fat if there be any, being firſt remov'd) there appearing then nothing but Veſſels, yet ſo as with a *Microſcope* may be ſeen thorough, when they are extended. 2. That if any one, as he is at Dinner, take a piece of Fleſh, and begin either at the Head or Tail of a *Muſcle*, he may divide it *in infinitum*, all along from Head to Tail without breaking any thing of that called Fleſh, only theſe tranſverſe Fibres that ſeem to ſtitch them together, and (as I am apt to think) paſs through the very Bodies of the ſmalleſt of them, and quite through the whole Muſcle up the cutaneous Poroſities; ſo that there is not one of theſe ſmall *Ducts*, that run *per longitudinem*, but 'tis furniſh'd with a ſufficient number of out-lets, when need requires, though too minute to ſuffer any Alimentary Juice to paſs tranſverſly (in a living Body) or any other Liquor when the Body is dead and cold. But to wave their Uſe at preſent, and to return to what I was ſaying, compreſs between the Fingers this bit of Fleſh, and you ſhall find the Juice, eſpecially if the Meat be hot, to go before your Fingers toward either end you pleaſe; but if you Compreſs both ends you ſhall ſee it ſwell into the middle; and again, if you preſs the middle it will run out at both ends. But further, ſuppoſe a piece of Fleſh, called *Parenchyma*, as big or as little as you pleaſe, in any part of the Body, and let me prick it with a Needle, where you ſhall appoint; if you feel it, I preſume you will acknowledge, a Nerve or a Fibrilla related to it is touched: If you feel it not, I am ſure ſome Liquour, either ſanguineous or other, will follow the Needle: And from whence can that come but out of Veſſels? unleſs accidentally, as by a Contuſion, *&c.* it be extravaſed; In which Caſe my Argument will not be injured, becauſe the Part is depraved, whereas I ſpeak of the Parts as they are in their Natural State.

To confirm and illuſtrate all which, I deſire, that the following familiar Obſervations may be conſidered:

1. If a Horſe, fat and fair to look on, without a hollow to be ſeen between his Muſcles, be rid extream hard and into a great Sweat, and then kept one Day without Water or moiſt Meat, you ſhall ſee him look ſo thin in

many

many places, as in the Muſculous Parts, that you will hardly believe it to be the ſame Horſe, eſpecially if he be (as the Phraſe is amongſt Horſe-Maſters) a *Naſh* or *Waſh* Horſe. The cauſe of which thinneſs, will eaſily be granted to be only an exhauſtion of Juice, expended out of the Blood, which did ſtuff out theſe Veſſels. And whoever, that is uſed to ride hard, ſhall obſerve how thick this foul Horſe breaths, and at what a rate he will Reek and Sweat, will not much wonder at the Alteration. But if the Horſe be a hardy one, and uſe to be hard ridden, then you will ſee that one Days reſt, and his Belly full of good Meat and Drink, will in one Day or two reſtore him to his former plight, the Food being within that ſhort ſpace of time ſo diſtributed, that all the Veſſels will be repleniſhed again, as before. And the cleaner the Horſe is, the ſooner recruited, and the leſs ſign of hard Riding will appear. This ſeems to ſhew the facility, with which the Juice, called Blood, paſſeth; which ſurely, if there were ſuch a thing as a *Parenchyma*, might by ſeveral Accidents (not difficult to mention) be ſo deprav'd in ſeveral Parts of it, that it might looſe its receptive Faculty; than which it may be thought to have none of greater uſe, being ſuppoſed to be vvithout Veſſels

2. Diſcourſing ſometimes with Graſiers in the Country, about the Paſture of Cattle, I have been informed by them, That if they buy any old Beaſts, Oxen or Cows, to feed, they chooſe rather thoſe that are as poor as can be, ſo they be ſound; becauſe that, if they are pretty well in Fleſh, what they then add to them by a good Paſture, though it make them both look and ſell well, yet it will not make them eat ſo well, their Fleſh proving hard and very tough: which ſome may ſuppoſe to be the age of *Parenchyma*; and ſo it is of that ſo call'd. But if thoſe Beaſts be old and extreamly poor, then they feed very kindly, and will be not only very fat, but ſpend well' like young ones, and eat very tender. Of which I take the reaſon (excluding a *Parenchyma* now) to be this: When an Ox or a Cow is grown old, and in an indifferent plight as to his Fleſh (for ſo it is called) all theſe Veſſels having been kept at that ſize for the moſt part, have contracted a tenſeneſs and firmneſs, and their Fibres leſs extenſive, not ſo fitted for the reception of more unctuous Particles to relax them; and that additional unctuous matter, which occaſions fatneſs, is forced to ſeek new quarter, any where (often remote from Muſcles) where it can be with leaſt difficulty received; ſometimes to one place, ſometimes to another, as may be ſeen in Shambles. Whereas, if there were ſuch a thing as a *Parenchyma*, that certainly would like a hungry Spunge immediately ſwell up in ſeveral parts, (which without much difficulty might be diſcovered in the diſſection) and more eminently where it ſhould find the Pores moſt patent: And in the diſſection of ſuch Muſcles it would be very ſtrange, not to find ſome, if not many pieces of them in various ſhapes, to the great inconvenience of the Parts in which they are ſeated: Which yet I confeſs, I could never find in any Muſcle unleſs it were where there had been a Contuſion, or an Impoſtume, or the like. But according to my Opinion, of the *Parenchymous* Parts, the reaſon why the Fleſh of a very lean Ox or Cow, that hath got new Fleſh in a good Paſture, eats tenderer, ſeems to be this: That in a very lean Beaſt, the Veſſels deſigned for admitting and di-

ſtributing the nouriſhing Juice, are ſo near contracted, and lie ſo cloſe together, that when once they are relaxed by freſh and unctuous Nouriſhment, they extend every way in all extenſive Parts, until in a ſhort time the whole Creature is, as it were, created anew, having got new Fleſh upon old Bones. And the neceſſity of extream Extenſion makes all thoſe Parts, that are, as has been ſaid, for the admiſſion of Nouriſhment, ſo thin and fine, that it will make the lean Beaſt, put into a rich Paſture, eat young and tender: Whereas one of the ſame Age, that never was very poor, fed in the ſame Paſture ſhall eat hard and tough.

3. It has been obſerved, that *Corpulent* Perſons, in ſome Diſeaſes that ſeize on them do fall away to wonder, not only in the Waſte, but in the Arms, Legs,and Thighs; and the very Calves of the Legs have been obſerv'd ſo flaccid and looſe, that one might wrap the Skin about the Bones. The reaſon whereof, according to the Opinion delivered, may be eaſily rendred to be, A great conſumption of the ſtock of Liquors, that in Health kept the Veſſels turgid; which Veſſels I ſuppoſe to make up thoſe Muſcles. But when the Pores are obſtructed, that the Nouriſhment is hindred (which then alſo uſes to be but ſparingly adminiſtred) and Sweats, either ſpontaneous, or forced are large, there muſt needs be a great expence of thoſe Liquors, the ſupply being but inconſiderable: Which cannot but contract all theſe Ducts of all ſorts nearer together, and make them much leſs in themſelves, meerly from Exhauſtion: Or, if there ſhould be no Sweats, the internal Heat ſpends the Spirits, and dries up the Liquors; the conſequence whereof may reaſonably be preſum'd to be this flaccidity of Parts, and great and ſudden Change made in them; not that there is need of any *Parenchyma* to fill up theſe Muſcles, conſidering what hath been ſaid.

A Child, about 6 Years Old, who in Face was as large as a full grown Woman; by Dr. Hen. Sampſon n. 217. p. 80.

XII. One *Hannah Taylor*, (born in *Crouched-Friers June* 12. 1682.) was till 3 Years old very ſickly, lean, and not able to go alone; but about *Bartholomew*-tide, 1685. ſhe began to grow ſtrong and fat, which increaſed till the time of her Death: She was alſo a very forward Child of Underſtanding, had her *Pubes* grown thick and long, as alſo Hair under her Arm-pits, and a Downineſs upon her Chin, unuſual with thoſe of her Sex, except in ſome aged Perſons.

About half a Year before ſhe dy'd ſhe began to complain of Pains, eſpecially on her left ſide, and voided Gravel often by Urine and with pain. Her Breath was ſtreight, as is uſual to Fat People, eſpecially when ſhe went up a pair of Stairs: yet on that very Evening before ſhe dy'd, ſhe walked abroad, was merry and lively, went to Bed and ſlept as at other times; but after Midnight awaked, cry'd out of a great pain in her ſide, and ſaid, Mother, I want breath, I ſhall dye; and in leſs than a quarter of an Hour was quite dead.

The Meaſures and Weight of her Body were as followeth: Round the Breaſt a Yard and 2 Inches, over the Hips at the Navel 1 Yard 5 Inches, over the Stomach 1 Yard; her height 1 Yard wanting an Inch, round the Thigh 1 Foot 9½ Inches, Calf of the Leg 13 Inches, upper part of the

Arm

Arm 14½ Inches, the Wriſt 7 Inches; her Weight 95 *l.* She had a Face as big and broad as any Fat grown Woman of 20 Years. Her Chin and Breaſt were ſo thick laid with fat, that ſhe was forced to hold up her Head, (or rather throw it backward) as ſhe walked. Theſe Meaſures were all taken before the Diſſection. The thickneſs of the Fat upon the Muſcles of the *Abdomen* was 2 Inches, and not much leſs upon the *Sternum*: After the Fat was removed (which was as much as is uſually in moſt fat and grown Perſons) the *Abdomen* was yet very protuberant and round, and yet the fat contained therein not extraordinary much, neirher on the *Omentum* or *Meſentery*: yet it was more than is uſual in well fed Perſons, and ſo much that with the bigneſs of the other internal parts (which were all of the largeſt ſize) it made her have ſo big and protuberant a Belly. The Guts were all inflam'd and thick, the Liver large, the left Kidney (where was the ſeat of her Miſery) exceeding large, and double the bigneſs of that on the right ſide; upon the Diſſection whereof there iſſued out a vaſt quantity of Blood, both from all the Veſſels of it, and out of its *Pelvis*; and after ſeveral times ſpunging of it, yet it came flowing in from the *Emulgent Artery*: a certain argument of a great plenitude in the *deſcending Trunk*, which cauſed the Inflammation in the *Meſentery*, and the *Nephritis* in the Kidney. Here was alſo ſome ſmall Gravel, which poſſibly had choak'd up the *Ureter*; though that was not examined, but becauſe there was no Blood in the Bladder, I juſtly make this Conjecture. The Uterine Parts had nothing bigger, or more remarkable than in others of her Age. The *Teſticles* were large, but ſmooth and white, without protuberances or ſhew of Eggs. The Bladder had a purulent Matter in it. When the Breaſt was denuded of its Fat, it ſhewed no bigger than of another Child of her Age. The Cavity was totally filled with the *Lungs* and *Heart*. The *Heart* was well, and had very ſtrong Fibres, and no *Polypus*. But the *Lungs*, beſides that they were extended to fill up the whole Cavity, were annexed ſtrongly to ſeveral parts of the *Pleura*, and had ſeveral Protuberances as big as Nutmegs fill'd with a Pulp like an *Atheroma*, and were in divers places rotten and corrupted. The evident Cauſe of her Death lay in the Inflammation of the lower parts, but the ſuddenneſs thereof muſt be from ſome Impreſſion which that Inflammation made upon the Original of the Nerves moving the *Diaphragm*, *Bronchia*, and other parts of *Reſpiration*; for her great and only Complaint was want of Breath. Beſides, her very Face and Head were miſerably coloured with redneſs of ſtagnant Blood. The Head was not opened.

XIII. Sir *F. L.* was ſwell'd mightily in his Legs, *Abdomen*, Stomach, and to his very Throat, even to Suffocation that he dy'd. Mr. *K*——*s* was ſent for to let out the ſuppoſed Waters; for his Phyſicians had treated him as in a *Dropſy*, with powerful *Diuretieks*, &c. and 1 or 2 Pails were provided ready to receive the Matter; but upon opening him, there iſſued forth nothing but a Guſh of Wind. He cut 6 Inches and a half deep of *Fat* on the *Peritoneum*, and dy'd of a *Corpulentia nimia*, being one that fed prodigiouſly.

Corpulency miſtaken for a Dropſy; communicated by Mr. Greenhil. n. 265. p. 618.

XIV.

XIV. *Accounts of Books Omitted.*

n. 167. p. 866. 1. MEdicina Septentrionalis Collatitia, ſ. Rei Medicæ nuperis Annis à Medicis *Anglis*, *Germanis*, & *Danis* emiſſæ Sylloge & Syntaxis; Opera *Theophili Boneti*. D. M. *Genevæ* 1685. *in Fol.*

n. 105. p. 113. 2. Anatome Corporis Humani, conſcripta ab *Isbrando de Diemerbroeck*. M. D. *Ultrajecti* 1671. *in Quarto.*

n. 178. p. 1309. 3. *Godefridi Bidloo*, M. D. Anatomia Humani Corporis. *Amſtel.* 1685. *in Fol.*

n. 183. p. 4077. 4. The Chirurgical and Anatomical Works of *Paul Barbette*. M. D. Together with a Treatiſe of the Plague. *Engliſhed* out of *Low-Dutch*. *Lond.* 1672. *in* 8°.

n. 40. p. 811. 5. *Franc. de le Boe Sylvij* Praxis Medicæ Idea nova. *Lugd. Batav.* 1667.
n. 71. p. 2159. in 12°. & 1671.

n. 88. p. 5105. 6. Theſaurus Medicinæ Practicæ; Studio & Operâ, *Thom. Burnet.* M. D. 1672. *in* 4°.

n. 118. p. 435. 7. *Jacobi Barneri* Ph. & Med. D. Prodromus *Sennerti* Novi, ſeu Delineatio novi Medicinæ Syſtematis, *&c. Auguſtæ vindelicorum.* 1677. *in* 4°.

n. 162. p. 704. 8. *Joh. Dolæi*, M. D. Encyclopædia Medicinæ Theoretico-Practicæ, &c. *Francofurti ad Mænum.* 1684. *in* 4°.

n. 174. p. 1140. 9. *Mich. Ettmulleri* Opera omnia Theoretica & Practica, &c. *Lond.* 1683. *in* 4°.

n. 41. p. 835. 10. A Diſcourſe concerning Phyſick, and the many Abuſes thereof by the *Apothecaries*. *Lond.* 1668. *in* 8°.

n. 121. p. 513. 11. The *Colledge of Phyſitians* Vindicated, and the true State of Phyſick in this Nation faithfully repreſented, &c. by *Char. Goodall.* M. D. *Lond.* 1676. *in* 8°.

n. 99. p. 6175. 12. Apologema pro Urinis Humanis; Auth. *Antonio Eygel.* M. D. *Amſtel.* 1672. *in* 8°.

n. 154. p. 425. 13. De Urinis, Pulſibus; de Miſſione Sanguinis; de Febribus; de Morbis Capitis, & Pectoris. Opus *Laurentij Bellini. Bononiæ.* 1683.

n. 171. p. 1023. 14. *Dav. Abercrombij* M. D. de Variatione ac Varietate Pulſus Obſervationes. Acceſſit ejuſdem Authoris nova Medicinæ, tum Speculativæ tum Practicæ, Clavis, &c. *Lond.* 1685. *in* 8°.

n. 76. p. 2289. 15. *Joh. Bapt. Sylvatici* Inſtitutio Medica de ijs qui Morbum Simulant deprehendendis. *Francofurti ad Mænum.* 1671. *in* 12°.

n. 107. p. 162. 16. *Tho. Bartholini* de Anatome Practica ex Cadaveribus Morboſis adornanda Conſilium. *Hafniæ.* 1674. *in* 4°.

n. 50. p. 1018. 17. Obſervationes Medicæ, *Mich. Leyſeri*, *Henr. a Moinichen*, *Mart. Bogdani*, *Jac. Seidelij*, è Muſæo *Th. Bartholini. Hafniæ. in* 8°.

n. 54. p. 1094. 18. *Theodori Kerckringij*, D. M. Spicilegium Anatomicum; continens Obſervationum Anatomicarum rariorum Centuriam unam, nec non Oſteogeniam Fœtuum. *Amſtel.* 1670 *in* 4°.

n. 125. p. 521. 19 Two Treatiſes; the one, Medical, of the Gout, by *Herman Buſchof* Senior, of *Utrecht*; the other, partly Chirurgical, partly Medical, containing

taining ſome Obſervations and Practices relating to ſome extraordinary Caſes of Diſeaſes in both Sexes; by *Hen. Van. Roonhuyſe*; *Engliſhed* out of *Dutch. Lond.* 1676. *in* 8°.

20. *Caroli Drelincurtij* Experimenta Anatomica; quibus adjecta ſunt plurima Curioſa ſuper Semine Virili, Fœmineis Ovis, Utero Uterique Tubis, atque Fœtu. *Lugd. Bat.* 1684. *in* 12°. *n.* 169. *p.* 945.

21. Dr. *Liſter*'s Exercitationes Medicinales. *n.* 222. *p.* 322, 326.

22. *Medicina Statica*, or Rules of Health; originally written by *Sanctorius*, now *Engliſhed* by *J. D. Lond.* 1676. *in* 12°. *n.* 136. *p.* 921.

23. Trichiaſis admodum Rara. *Lond.* 1684. *n.* 170. *p.* 986.

CHAP. II.

The Head.

I. S. *Malpighi* pretends to have diſcovered, that the exterior and ſofter part of the Brain, doth not cover only the *Corpus Calloſum*, but is alſo inſerted into it in many places; That the *Corpus Calloſum* is nothing but a Contexture of ſmall Fibres, iſſuing from the *Medulla Spinalis*, and terminating in the ſaid exterior part of the Brain. And theſe Fibres, he ſaith, are very manifeſt in the Ventricles of the Brain of Fiſhes. He pretends, that as half, or at leaſt a third, of the Blood of an Animal is conveigh'd into the Brain, where yet it cannot be conſumed, the fineſt *Serum* of this Blood is filtrated through the exterior part, and then entring into the Fibres of the Brain, is thence conveigh'd into the Nerves; which he affirms to be the Reaſon, that the Head is ſo often found full of Water, when the Brain hath received a Wound, or an Alteration by ſome Diſtemper.

Diſcoveries concerning the Brain; by S. Malpighi. *n.* 27. *p.* 491.

II. 1. Here was lately produced an Infant come to maturity, having inſtead of a Head and Brains a maſs of Fleſh like any Liver, and was found to move. This Fœtus occaſioned a Queſtion for the *Carteſians*, How the Motion could be perform'd, and yet the *Glandula Pinealis*, or *Conarium*, be wanting; nor any Nerves viſible, which come from the Brain? The Marrow in the Spine was of the ſame ſubſtance. It liv'd 4 Days and then dy'd.

A living Birth without a Head, at Paris; *by* M—. *n.* 26. *p.* 480.

2. In *Nov.* 1673 I was called to a ſick Woman, brought to Bed that very day I went to ſee her. After I had preſcrib'd the Phyſick I judged neceſſary for the Mother, I ask'd for the Child, which dy'd, I heard, as ſoon as 'twas born. The Body of it appear'd outwardly very well formed and very fat; but the Head was ſo deformed, that it frighted all that were preſent. It had no Front; the two Eyes were on the top of the Face, very big, and almoſt without any Orbit to lodge them in. The upper and hind part of the Head was red like coagulated Blood, and reſembled the bottom of a Calf's

An odd Fœtus without a Brain; by M. Denys *n.* 99. *p.* 6157.

Calf's-Head when cut and ſevered from the *Vertebræ* of the Neck. I had the curioſity to examine this red Fleſh, and I found under it a Bone, that was not a hollow Skull, but a ſolid Bone in the form of a ſmall Oyſter. I had it opened every way, but I found no hollowneſs nor *Brains* in it. This Bone was only faſten'd before to the Bones of the Face, and not behind to the *Vertebræ* of the Neck; ſo that the Marrow of the Back-bone had no communication with the Head. I purſued the Optick Nerves, and loſt them in this Bone, which was in lieu of the *Cranium*, and was not at all ſpungy, but very hard. It ſeems to me ſomewhat extraordinary, that a Child ſhould be able to live nine Months without *Brains*; for I was inform'd, that it was very lively and brisk in the Mother's Belly, but dy'd as ſoon as it came into the Air.

A Child born Alive without a Brain; by M. Le Duc. *n.* 226. *p.* 457.

3. 1. *Apr.* 3 1695. I was called to a Woman aged about 28 Years, 6 Months and a half gone in her third Child, who fell from a Stair about 8 Days before; and I happily delivered her of a Male Child that lived half an Hour. He was big and ſtrong, and all the parts of the Body well proportioned, as they ought to be Naturally, except the Head, the hinder part whereof was flat, as if it had been taken off with the ſtroke of ſome Weapon, even to the *Os Sphænoides*; there was neither *Brain*, *Cerebellum*, nor *Medulla Oblongata*: the Cavity which ought to contain theſe was very ſuperficial; I found in their place, a black and livid Subſtance, covered with a Membrane, which may be the *Dura* and *Pia Mater* joyned together; this ſubſtance had coloured the *Os Petroſum* and other Bones of a deep red colour. I thruſt a Stillet, or Probe, into the cavity of the *Vertebres*, where ought to be placed the *Medulla Spinalis*, but found no oppoſition; for in effect, it was filled with a red ſtinking Liquor, contained in the Membranes of the *Medulla Spinalis*. The Viſage of this Child was a little deform, becauſe of the want of the *Cranium*, which might have been communicated to the Bones, as yet tender, that ſuſtained the Skin of the Face. The Eyes were in great Motion during the time it lived, but we found nothing in the place of Muſcles and Nerves but Skins and Filaments very ſmall, and not capable of Contraction, mixed in a rotten Humour, ſo that this great Motion might rather proceed from the Motion of the *Palpebræ*. There has paſt under my Hands 3 Subjects like unto this, all Male, and who lived ſome time.

By Dr. Ch. Preſton. *ibid. p.* 439.

2. I was preſent when this extraordinary Child was Diſſected. We found the external parts all well proportioned, except that it wanted the *Cranium*, *Cerebrum*, and *Cerebellum*; the Viſage was a little deform, it had Eyes and Ears like a Monkey, and all over the Body was more Hairy than ordinary. In the place of the *Brain* we could diſcover nothing but a Subſtance like congealed Blood, covered with a Membrane; and inſtead of the *Optique Nerves* we only found ſome ſmall Filaments.

But this *Examen* not being ſatisfactory to me, I carry'd the Subject to M. *Du. Verney*, *Profeſſor* of *Anatomy* in the *Royal Garden* at *Paris*. He traced the 8*th* and 9*th* Pairs of *Nerves* and *Intercoſtal*; and having cut up the Canal of the *Vertebres*, diſcover'd the *Medulla Spinalis* all along the Cavity, and traced all the *Vertebral Nerves* proceeding therefrom; as alſo the *Sciatick Nerve* conſiderable

rable enough. It is true, the *Medulla Spinalis* was not here of that Conſiſtence as in Adult Perſons; but one could with ſome pains obſerve all the 4 Tunicks, and the two Subſtances as in the *Brain*, to wit the *Cortical* or Glandulous Subſtance, and the *Fibrous* or white, but with this difference, that the brown Subſtance is exterior in the Brain, but interior in the *Medulla Spinalis*, for it is as it were a 3d *Brain* contained in the Canal of the *Vertebres*, ſo framed for its defence; for there are *Meninges* as in the *Brain*, Sinus's and Cavities which may paſs for *Ventricles*: In a word, one can ſay all of it that they can of the *Brain*, and more, for it appears more ſenſible and neceſſary for the Life, for you can take the *Brain* or *Cerebellum* from an Animal, and yet the Animal ſhall live ſome time thereafter; but a Wound or Compreſſion of the *Medulla Spinalis* will cauſe ſudden Death. This is confirm'd by ſeveral Anatomical Experiments. 1. M. *Du Verney*, 1673. took the *Brain* and *Cerebellum* from a Pigeon, and in place thereof filled the *Cranium* with Flax, notwithſtanding which it lived ſome time, ſearched for Aliment, did the ordinary Functions of Life, and had the uſe of Senſe. 2. M. *Chirac*, *Profeſſor* of *Anatomy* at *Montpelier*, took the *Brain* from a Dog, yet he liv'd ſome time, but when the *Cerebellum* was taken out he dy'd immediately; but he has obſerved, that by blowing into the *Lungs* the Animal has lived an Hour although wanting the *Cerebellum*. 3. He took from another Dog half of the *Cerebellum*, but he dy'd immediately. 4. After he had taken half the *Brain* from a 3d Dog, the Dog continued to have the Motion of all the parts, and could walk about; and even after he had taken away all the *Brain*, he had yet Senſe and Reſpiration. 5. He ſeparated the *Medulla Oblongata* of a 4th Dog from the *Medulla Spinalis*, by introducing a pair of Sciſſars between the firſt *Vertebre* and the *Os Occipitis*, the Dog had dy'd immediately, but by blowing into the *Lungs*, the Motion of the *Heart* continued, and the Animal could move his Body. 6. He took the *Cerebellum* from a 5th Dog, but he lived 24 Hours, and his Heart beat well.

All theſe Experiments let us ſee, that an Animal may live ſome time tho' imperfectly, wanting the *Brain*, and even the *Cerebellum*, but there is no Experiment where ever they lived wanting all; therefore I humbly conceive, the *Medulla Spinalis* was not here wanting, for it has ſupplied the defect of the *Brain* and *Cerebellum*, and the Animal Spirits have been ſeparated and diſtributed for continuing the Circulation of the Blood. For 'tis to be conſidered, that altho' the *Intercoſtal Nerve* and *Eighth Pair* have their Origine in the *Medulla Oblongata*, yet after their entry into the Cavity of the Breaſt, they are united with Branches from almoſt all the *Vertebral Nerves*, and with them make up ſeveral *Plexus's*, and from thoſe *Plexus's*, ſeveral Branches are emitted that go to the *Heart*, and other Parts, ſufficient for the continuing the Circulation of the Blood, which has occaſion'd ſome to run into a miſtake, thinking the Circulation is to be explained ſome other way, than by the Influx of the Animal Spirits into the Nerves, which they endeavour to prove by an Experiment on a Dog, of tying the *Intercoſtal* and *Eighth Pair* of *Nerves*, before they enter the Cavity of the Breaſt, and yet the Dog ſhall live 2 or 3 Days thereafter. But except they can tye all the *Vertebral*

Nerves, or at leaſt tye the *Nerves* at their Entrance into the Heart, their Experiment is not ſo convincing: And the Symptoms which ordinarily happen, even upon tying the *Intercoſtal* and *Eighth Pair*, is an evident Proof of the contrary, for the Animal is taken immediately with *Convulſions*.

I ſhall not pretend to determine after what manner this want of the *Brain* was ſupplied, or whether the *Brain* and *Cerebellum* were carryed off by the ſtrong force of Imagination, or by ſome Accident, or Corruption: But whatever of theſe obtain, I am apt to believe that all the parts of this *Fœtus* were once entire, and perfectly framed. And the tracing of the 8*th* and 9*th* *Pair* of *Nerves* and *Intercoſtal*, who take all their Origine from the *Medulla Oblongata*, ſeems to be a proof of it; and how far the force of Imagination goes, and what influence it has upon Children, we have ſeveral Inſtances. We have alſo ſeveral Obſervations of like Caſes with this Infant, delivered to us by M. *Mauriceau*, and M. *Peu*, and other Authors.

An Infant with the Brain depreſſed into the hollow of the Vertebræ *of the Neck; by Dr.* Edw. Tyſon. *n.* 228. *p.* 533.

4. Some Years ago, I was called to ſee a Birth which was very ſurpriſing; The Midwife informed me, that the Child was alive, but dy'd in the Birth or a little before. I found it well grown; all the Limbs and Body well proportioned, and plump; the Face well Featur'd, only from the Eye-brows, the *Skull* was perfectly depreſſed down to the *Os Sphænoides*, or Baſis of the *Calvaria*; ſo that it had no Forehead at all. I open'd the *Cranium* in ſeveral places, before I could find any *Brain* at all; but at length I obſerved, near the paſſing out of the *Medulla Oblongata* to the *Medulla Spinalis*, a ſmall quantity of the *Brain*; the whole might be included in a Walnut-ſhell: it was covered over with a bloody Matter. But thruſting down my little Finger thro' the Foramen where the *Medulla Spinalis* paſſes, I obſerved a very large Cavity in the hollow of the *Vertebræ* of the Neck, ſo that I could turn my Finger round a good compaſs there. This large Cavity I found to be filled with a Subſtance like the *Brain*, or *Medulla Spinalis*, or both: but far larger than the *Medulla Spinalis* it ſelf could be in ſo ſmall an Infant. This eaſily made me to conclude, that the *Brain* muſt be preſſed down hither, which I was the more induced to believe, becauſe the Mother informed me, that when ſhe was with Child, ſhe received a conſiderable bruiſe in her Belly.

How far the *Medulla Spinalis* may anſwer the Office of the *Brain*, eſpecially in the Embrio's, where there is no exerciſe of the Senſes, nor the Imaginative Faculty, will be no great difficulty to apprehend; ſince for the Functions of Life in them, the Spirits generated even in the *Medulla Spinalis* (for it has a Glandulous Subſtance too, but inwards) may ſuffice: eſpecially in this Inſtance, where I do ſuppoſe a great part of the *Brain* to be detruded (by the bruiſe the Mother received) into the hollow of the *Vertebræ*: And do Quære, whether in thoſe Inſtances that are given of Births of Infants without *Brains*, there might not be the like Accident of the *Brain*, or the principal parts of it being depreſſed into the *Vertebræ*; which in Embrio's (before hardned into Bones) are parts extendible.

A Child born without a Brain; by M. Baſſiere, *n.* 251. *p.* 141.

5. In *Oct.* 1698. a *French* Woman, living at *Dung-hill*, of a good Complexion, and in perfect Health during all the time of her being with Child, was brought to Bed of a Boy: He was Tall, well ſhaped, and very ſound. And tho' it be uncertain whether he was born alive, yet the Mother aſ-

ſured

ſured me, that ſhe felt him ſtirring an Hour before, and indeed the good condition of his Body ſufficiently proves that he was alive. The Skull was unequal, and the Skin thereof, though full of Hair, a little redder than the reſt of the Body. The *Coronalis* Bone laid flat upon the *Sphænoides* Bone, which made the Eyes look as if they had been placed in the top of the Forehead. The *Squamoſa* part of the *Temporal* Bones was wanting, there being but the *Os Petroſum* which was in its natural place, and in which were the Organs of the Senſe of Hearing in very good order. There was no *Parietal* Bones, nor any thing equivalent. Of the *Occipital* Bone there was but the Baſis which joyneth to the *Sphænoides*, in the middle whereof was the great Hole through which the *Medulla Oblongata* commonly paſſeth, all the upper part of this Bone being wanting, without any mark of having been corroded or gnawn, the edges of which were very ſmooth. All the upper part of the Bones of the Skull being wanting, the Skin had no other ſupport but its Baſis, which was the reaſon why the Top of the Head was very unequal and rough. No Brain at all was found, nor any mark in the whole extent of the Skull, that there had been any, there being no ſpace left between the Baſis of the *Skull* and the Skin to contain it; there Was no *Dura Mater* neither, the Bones being covered only with a very thin Membrane. Neither the *Carotides*, nor the *Vertebral* Arteries did penetrate the *Skull*, but by ſmall Twigs, ſpread in the thin Membrane. The Beginning of the *Medulla Spinalis* was under the 4th *Vertebra*, like a ſmall ſtump wrap'd up in the *Dura Mater*; the *Medulla* was very ſound, and of the uſual bigneſs; and all the *Nerves*, which parted from it, were in their Natural order. The Eyes were well ſhaped, and all the parts belonging to them in their Natural ſituation: but all the *Nerves* did terminate themſelves in the Holes of the *Skull*, through which they commonly paſs; they did reach no further, nor had any Communication with any other. The Tongue was very freſh, and doubtleſs had performed the Deglutition to make the Child ſwallow the Colliquamentum, of which there was a good quantity in the Stomach. The *Larynx*, and all the parts of the Throat, were as the reſt of the Body in a good Condition.

One Hemiſphere of the Brain *ſphacelated, with a Stone in it; by Dr.* Edw. Tyſon. *n.* 228. *p.* 535.

6. *Dec.* 12. 1688. I was deſired to be preſent at the Opening of Mr. *A.* About 2 Months before He had received in a Quarrel a great Bruiſe on his Head. After ſome time he took his Bed, and complained of a moſt violent Pain in his Head. He ſometimes Vomited; ſometimes was in *Convulſions*; ſometimes in the Day he would have a great *Stupor* upon him; and when he waked he would be Delirous. His Swallowing was difficult, and he would grin his Teeth: His Eye-ſight afterwards failed him, and he loſt his Memory; and upon the leaſt Motion of his Body would faint away, and in the whole courſe of his Diſtemper was Feveriſh. Upon opening his Head, I obſerved the Blood Veſſels of the *Meninges* very much extended, and the greateſt part of the left *Hemiſphere* or ſide of the *Cerebrum* or Brain to be perfectly rotten or Sphacelated, not having the leaſt Conſiſtency, but Purulent, and ſoft: Nor could I diſtinguiſh the *Medullary* Subſtance from the *Cinericeous*; but all of a dark reddiſh Colour. In the *Ventricles* of the *Brain* I

observed a great deal of Water: And upon Diſſecting the *Protuberantia Orbicularis*, called the *Teſtis*, on the Left ſide, which was as big as a Nutmeg, I found in a Purulent matter there a Chalky Stone, about the bigneſs of a Cherry-ſtone, but flat and not very thick; and in taking it out I found it friable.

Of an Hydrocephalus; by Mr. J. Friend. n. 256. p. 318.

III. The outward Dimenſions of this Head before it was opened, were as follows, *viz.* From the *Eye-brows* over the Crown to the Nape, 23 Inches; the Circumference from the Nape round the *Oſſa Bregmatis*, 26; but round the *Os Frontis*, 24; from Ear to Ear, over the Crown, 19; from the Eye-brows to the Chin, 4; from one extremity of the Eye-brows to the other, $4\frac{1}{2}$; from the Chin to the *Coronal* Suture, $7\frac{1}{2}$; Circumference from the Chin round the Crown, 30; from one extremity of the Ear backward to the other, round the Noſe, 12; and round the Nape, $6\frac{1}{2}$; from Temple to Temple over the Forehead, 11; Circumference of the Head round the *Os Frontis* and *Occipitis*, 29; Circumference of the Neck, $9\frac{1}{2}$; length of the Neck, 2; length of the Body, 33; Circumference of the Thorax, 18; length of the Foot, $4\frac{1}{2}$; from the middle Finger's end to the *Acromion*, $12\frac{1}{2}$; Circumference of the Arm, 5; of the Calf, $5\frac{1}{2}$; of the Thigh, 8.

After the Integuments were removed, the top of the *Cranium* appeared ſoft and membranous; the extent of the Membrane from one Temple to the other was 8 Inches; between the *Parietal* Bones, $3\frac{1}{2}$; from the *Os Frontis* to the *Os Occipitis*, 12. In the middle juſt upon the Crown lay a Bone (in ſome places a little Cartilaginous) 5 Inches long, and 1 broad, joyned to the Membrane on every ſide; of the ſame thickneſs with the reſt of the upper part of the *Cranium* that was Bony, which was extreamly thin every where, and the *Laminæ* lay ſo cloſe that in many places no *Diploe* could he diſcern'd. The Membrane was as thin as the *Pericranium*, which yet was eaſily divided from it. None of the Sutures were entirely cloſed, thoſe of the upper Jaw very looſe. In the *Temporal* and *Lambdoidal* was an infinite number of the *Triquetra Wormiana*, all which had ſo many diſtinct Sutures. Upon piercing the *dura Mater*, a great quantity of Water flowed out; it lay, as well between the *Dura Mater* and the *Pia*, as in the *Ventricles* of the *Brain*. The Liquor was thin, pale, and inſipid; there was taken out 5 Quarts of it. The *Dura Mater* was firm and entire, of its uſual thickneſs, and ſtuck very cloſe as well to the Membranous as to the Bony parts of the *Cranium*. All its Proceſſes and Sinus's were ſingular, the 4th Sinus ſomewhat larger than ordinary. A very large Vein of the *Dura Mater* entered the *Longitudinal* Sinus, directly forwards towards the *Criſta Galli*, contrary to the Courſe of the Blood. The *Pia Mater* was very much diſtended, and ſeem'd to be ſtretched as much as it could bear. It lay ſmooth and equal upon the ſurface of the *Brain*, there being neither any Circumvolutions in the *Brain* for it to go between, nor any Partition to the *Corpus Calloſum*, tho' there was a large *Falx* in the *Dura Mater*. The Lateral *Ventricles* were very thin: Towards the *Cerebellum* their upper part was quite waſted, ſo that nothing was left to cover the Cavity in that place but the

Pia

Pia Mater. This was ſo thin, that in ſtooping down the Head to empty the Water, it broke and hindred us from knowing exactly how much Water the Lateral *Ventricles* contained; but by their Cavity, which was very large, one might gueſs they held at leaſt a Pint each. The 3d. and 4th. *Ventricle* had ſome little Water in them, but were ſcarce larger than uſual. The *Brain* had all its parts plain and intire, tho' its Subſtance in moſt places was but very thin and looſe: About the *Corpora Striata & Thalami Nervorum Opticorum* it was tolerably thick, and firm enough, tho' nothing to what it is in a Natural State. The *Cerebrum* and *Cerebellum*, when laid out in their right Poſition, were 11 Inches long; the *Cerebrum*, croſs the Lateral *Ventricles*, 9 broad. After all the Water was taken out, both of them weighed 1 $\frac{1}{2}$ *l.* The *Corpora Striata & Thalami Nervorum Opticorum* were very ſmall in all their Dimenſions; withinſide towards the *Ventricles* they were wrinkled and lay in folds, like thoſe in the inner Coat of the Stomach. In the *Corpora Striata* there were no *Striæ* diſcernable. The *Plexus Choroides* was very ſmall; the *Glandula Pinealis* was ſomwhat bigger, but leſs compact than ordinary; the *Nates* were red and large, 2 Inches long, 1 broad, and 1 thick; the *Teſtes* were not diſtinguiſh'd from them by any Protuberance, they ſeem'd rather to be a Production into which the *Nates* leſſen'd by degrees like a Sugar-Loaf. The *Cerebellum* was very firm every where, and did not much exceed its Natural Bulk. The *Medullary* Trunk, which ſends out thoſe little Branches like Trees, was thicker and harder than uſual; the Branches were not ſo much diſpoſed like thoſe of a Tree, but went rather in ſingle oblique Lines, like ſo many Rays drawn from a Point. The *Nerves* were all Regular and plain; only the *Olfactory* were very ſmall; the *Optick* did not joyn before they entered the Orbits. The *Rete Mirabile* was very large, ſo was Dr. *Ridley's Circular Sinus.* On the right ſide were two *Carotid Arteries* (the *Intercoſtal Nerve* lay between them) they entered the Skull at the ſame Hole. The Trunk of the *Vertebral* (where thoſe Arteries unite) was extreamly big and full of Blood. The Veins were neither larger, nor more, than uſual. Upon the *Brain*, over the *Lateral Ventricles*, I could eaſily diſcern 3 or 4 *Lymphaticks*; but they were too ſmall to be traced.

The Mother of this Child brought it to *Oxford* for a Sight. She ſaid, ſhe was 3 Weeks in Travail, and at laſt was forced to have the *Vagina* ript for its paſſage. The Child was 2 Years and 6 Weeks old, it could ſpeak a little, could not go, nor hold up its Head; 'twas always Merry, never ſubject to Drowſineſs, Pain in the Head, want of Appetite, or Indigeſtion. Its Sight was ſomewhat dim, and its Smelling but dull. It never had any Illneſs, only 2 or 3 Days before it dy'd 'twas very much troubled with the Gripes, and upon opening the *Abdomen*, the Guts were found extreamly ſwelled with Wind. Every thing elſe was as it ſhould be,

IV. Illuſtriſſima Domina N. à multis retro Annis *Hypochondriacis* (prout vulgo dicuntur,) & *Hyſtericis* laboverat Symptomatis; quibus aliquoties, at nuperis Annis, ſupervenerat Narium Hæmorrhagia profuſa. Ad Periculum & à Morbis & ab Hæmorrhagia averruncandum *Phlebotomia*, inter alia præſidia, ſæpe

The Diſſection of a Lady, who dy'd of an Apoplexy; by Dr. Will. Coxe. n. 173. p. 1068.

ſæpe in ſubſidium vocata fuerat. Pridie vero ejus Diei, qui illi ſupremus erat, ad Hæmorrhagiam ſolitam proclivis erat, quam omni Ope ſub ipſo erumpere geſtientis Sanguinis primo Nixu prævenire ſatagebat, Periculum, quod non multo ante ab immodico ejus Effluxu evaſerat, iterum verita. Et quidem nimis fataliter ceſſit Remediorum quæ adhibuit ſucceſſus, Sanguine non amplius prodeunte ; unde ſe in tuto poſitam, vel eo ipſo ante obitum die, *Maij* 10. 1679. cenſuit. Cum ex improviſo fatalis illius immineret Cataſtrophe. Poſtquam enim Veſperi ſe intra Cubile compoſuerat, ſubito immani Capitis Dolore correpta erat; cujus gratia (vacillare ſtatim incipienti Lingua) Chirurgum extemplo advocari juſſit, qui Sanguinem detraheret. Ille autem, qui Mille Paſſus inde aberat, non ante appellere potuit, quam Nobiliſſima Domina è Vivis exceſſerat, quod intra Semihoram ab inſultu contigit.

Ad Cadaveris Apertionem vocatus, accito in operis Societatem Doctiſſ. D. *Tomkyns*, hoc notatu dignum invenimus, quod quamvis à 30 annis *Jecur* ab omnibus fere Celeberrim. Medicis, quos ſanitati ſuæ moderandæ admoverat, non modo ſumme obſtructum (quæ etiam de *Liene* pronunciata fuerat Sententia,) ſed etiam Scirrhoſum habitum fuerat , uſque adeo tamen ab omni labe immune erat, ut nulla vel minimæ Obſtructionis Veſtigia offendi potuerant. Solummodo prægrande erat, & proinde (in Macilento præſertim Corpore,) majorem ſolito in Hypochondrio Tenſionem efficiens, palpum iis facile obtrudere potuit, qui, pro ſolenni olim more, cunctorum Hypochondriacorum Titulo inſignitorum, Symptomatum Cauſas ab *Hepate* & *Liene* Obſtructis deducunt. Hoc ſaltem notavimus, quod nec in Cyſti Fellea, quæ plurimum contracta erat, nec in reliquis (quæ ſeſe conſpicienda obtulerunt,) per *Hepar* ſparſis Vaſis Biliaribus, quicquam Bilis repertum fuerit, nec ab ea Tincturam niſi admodum dilutam, hauſerant; verum in Cyſtis Cavitate quatuordecim reperiebantur Concretiones, quarum maxima pars magnitudine piſa æquabant, duæ vel tres paulo ampliores erant, preſſæ rotunditatis, exterius fere nigricantes, & Glabræ, atque Bezoar, poſtquam paululum Aeri expoſitæ fuerant, æmulantes, primo autem intuitu Pilulas Aloeticas referentes, intus Flaveſcentes, cum aliquali in Centro Cavitate, facileque Friabiles. *Lien* pariter ab omni labe immunis videbatur, ſed, non ſecus ac *Hepar*, ſolito grandior. *Pancreas* nulla evidentia Obſtructionis indicia prodebat. *Renes* & Sabulo, & Calculis, omnique Obſtruente Materia liberi erant, quamtumvis præ Doloribus, qui circa eorum Regionem aliquoties invadere ſolebant, crediderat aliquando Illuſtr. Domina, ſe *Calculo* laboraſſe. *Uterus* debite conſtitutus videbatur, quamvis ex Symptomatis, quibus antea laboraverat, haud pauca huic parti adſcribi ſoleant.

Intra *Thoracem*, obſervandum occurrebat, quod in dextro Latere *Pulmones* firmiter *Pleuræ*, 4 Digitorum Latitudine, adhærebant, variiſque in Locis, præſertim hic illic circa Loborum Margines, tanto Nigrore afficerentur, ut ad Sphacelationes Proni viderentur. Cor ſanum conſpiciebatur : Quodque forſan attendi mereatur, Pinguedinis ſat magna quantitas Baſi ejus accrevit, quanquam reliquo corpore valde emaciata fuerit.

Aperto

Aperto Cranio, Vaſa Sanguifera Membranas (*Tenuem* pæſertim) dextri Lobi *Cerebri* perreptantia, Sanguine admodum turgebant; ijſque ex illa *Cerebri* regione, (qua ſe laborare ſtatim ab invaſione conqueſta eſt,) diſciſſis, magna effluxit ſeroſi Sanguinis quantitas, quo evacuato, *Cerebrique* Subſtantia cultello aperta, ſeſe in conſpectum obtulit largus concreti Cruoris grumus, qui Stateræ impoſitus pependit Unciam circiter cum dimidia, atque proinde largam illic ſibi neceſſario formaverat cavitatem: aſt in *Ventriculos*, vel alibi inter Membranas, nil omnino Sanguinis effuſum erat. Siniſtrum Lobum quod attinet, nec ille, nec ejus Vaſa Sanguine ſupra modum turgebant. De Cærerò, nil in propera iſthac, quam Lucernarum Ope adornabamus, Diſſectione (nempe feſtinandum erat) comperire potuimus, unde concludendum eſſet *Cerebrum*, quantum Oculis patuit, male affectum eſſe; tametſi ex variis Symptomatis quibus à longo tempore obnoxia fuiſſet Nobiliſſ. D. (utpote *Cordis* Tremore, & Palpitationibus, magnis Anxietatibus, Muſculorum in Artubus aliiſque partibus contracturis & Doloribus, aliiſque pluribus *Convulſivis*) non levis Momenti Argumenta Succi Nervoſi haud parum Vitiati deſumi potuerint. Unde Corollarium iſthoc forſan deducere liceat; Succorum in Corpore contentorum Vitia non ſemper partium vel Continentium vel Secernentium culpæ, ſed quandoque (ſi non plerumque) propriæ eorum Degenerationi & Dyſcraſiæ imputanda eſſe. *Cerebrum*, cum *Cerebello*, *Cranio* exemptum, & ſuperfluo, qua licuit, Sanguine liberatum, pependit 2 *l.* 14 *Unc. Averd.*

V. The Incomparable *Malpighi*, who induſtriouſly apply'd himſelf to ſerious Studies, was of a good Habit of Body, and had ſeen 66 Years; but he had frequent Sickneſſes; ſharp Vomitings did torment him for 20 Years; he was troubled with the Gravel, a Hæmorrhagia in the Kidneys, a Rheumatiſm Fluxious; which with their troubleſome Conſequences, augmented his Infirmities. Scarce had theſe Evils given him ſome reſpite, when a cruel Palpitation of the Heart, with an unequal Pulſe came upon him. Moreover 4 Years before his Death a ſharp and biting Sweat fail'd not, all the Summer, to trouble him every Night. Pope *Innocent* XII having call'd him to *Rome* to make him his chief Phyſician, he began the firſt Year to looſe his freſh Colour; in the ſecond, he voided many Stones without much Pain; and in the third, which was the laſt of his Life, he found himſelf oppreſt, during the Winter, with a difficulty of Breathing.

The Death and Diſſection, of S. Malpighi; by Jean Marie Lanciſi. n. 226. p. 467.

His Health being thus inſenſibly undermin'd, and a Bilious Looſeneſs returning ever and anon, he was at length ſeiz'd with a *Vertigo*, a loſs of Speech, and a Contorſion of the Mouth, (*Spaſmus Cynicus*) and a Palſy of half the Right ſide. And tho' there was Appearance that he was out of danger by Bleedings, Purges, Diuretieks, and Antapoplectick Medicines, yet one might ſee, by his Melancholly Countenance, but eſpecially his want of Memory, that there was lodged in his Brain ſome Melancholy Humour. Therefore perceiving his End drawing near, he ſign'd with his Hand 3 Days before his Death, his Poſthumous Works, which he had order'd to be deliver'd to his Collegues of the *R. Society* at *London*. Then having confeſt him-

himſelf with great Humility, he attended generouſly, and with Faith in God, the Death which appear'd to him certain, and not far off. And on the 29*th.* of *Nov.* 1696. a terrible *Apoplexy* finiſht, in the ſpace of 4 Hours, this ſo precious Life.

This Learned Man foreſaw that he ſhould end his Days by an *Apoplexy*, and therefore forbad his Friends to open his Body till 30 Hours after his Death, for he knew well enough, that ſome who ſeem'd dead on a ſudden have reviv'd ſome Hours after. When he was open'd, we found the Bladder of Gall abounded with a black Gall; the Left Kidney had nothing amiſs; but the Right was twice as little, and had its *Pelvis* thrice as big; which diſcovered the Cauſe of the eaſy deſcent of the Stones. We found in the Bladder a little Stone that ſeem'd to have fallen into it a few Days before. The Lungs appear'd withered, with ſome mark of Corruption on the back-ſide The Heart was bigger than ordinary, and the ſides of the Left *Ventricle* felt harder and thicker in ſome places than others; yet there was no Polypus found in it.

The *Right Ventricle* of the *Brain* contained almoſt two Ounces of extravaſated Blood, and the *Left Ventricle* was ſwell'd with a thick and yellow ſort of Phelgm, which weighed more than an Ounce. Moreover the *Dura Mater* ſtuck cloſer to the *Skull* than is uſual. This proves, that the *Conglobated* Glands in the whole Body had thrown into the Maſs of Blood an Acid Lymph, and that the *Conglomerated* Glands of the *Hypochondria*, eſpecially thoſe of the Liver, had thrown into it a Melancholy Humour, and that theſe two ſorts of Humours being carryed into the Veſſels of the *Brain*, had diſpoſed the Blood to Coagulate there, and that having there corroded and broken the *Tunicles*, which ſerved for a ſtop to them, they had run into the Cavities, where they cauſed Death without a Remedy.

The Diſſection of a Boy, who dyed ſuddenly; by Dr. Cha. Preſton. *n.* 224. *p.* 262.

VI. Being call'd to the Diſſection of a Boy, about 9 Years Old, who died ſuddenly, being taken ill with a Fit of vomiting a little before his Death, we diſcovered the Left *Teſticle* out of its natural place, drawn up above the *Aponeuroſe* (or Holes of the 3 Muſcles of the *Abdomen*, which gives paſſage to the Spermatick Veſſels in Men that go to the *Teſticles*, and to the round Ligament of the Matrix in Women;) the Bladder was extreamly diſtended and full of Urine; in the Stomach we found a Worm of about 9 Inches in length, and a Line and half broad, as alſo a kind of ſlimy Matter; the Liquor contain'd in the Stomach was black, but perhaps it might have that Colour from ſome Remedies preſcrib'd againſt his Vomiting. The Lungs were tyed to the *Pleura* on the Right ſide, but were free on the Left; in the Left there was an Inflammation of the *Pleura*, with ſome Matter; as alſo an Inflammation of the External *Tunick* of the *Lungs*. In the Left *Ventricle* of the *Heart* we found a large *Polypus*, which filled the *Vena Pulmonaris*, and entered the Left Auricle, about 8 Inches in length, and two Fingers broad. In the Right *Ventricle* there was alſo a *Polypus* of about an Inch in length, which was ſo big that it almoſt ſtopp'd the entrance of the Blood into the *Vena Cava Aſcendens*. Laſtly, In the

Brain

Brain we found alſo a conſiderable *Polypus*, in the *Sinus Longitudinalis*. All other things were according to Nature.

The Falling-Sickneſs; by Dr. Turberville. n. 167. p. 839.

VII. I had a Gentlewoman my Patient, who was much troubled with the *Falling-ſickneſs*; In her Water I ſaw a great Number of ſhort Worms, full of Legs, and like *Millipedes*: I gave her two or three Purges, firſt with *Pil. Agaric.* and *Rhubarb*; but I ſtill perceiv'd, in every Water was brought me, 8 or 10, or more of the Worms; they appear'd lively and full of Motion; and the Fits continu'd daily. At laſt I gave her half an Ounce uf *Oxymel Helleboratum* in Tanſy-water, which wrought well, and was ſucceſsful; ſo that ſhe had a compleat Cure.

A Periodical Palſy; by Dr. Will. Muſgrave. n. 242. p. 257.

VIII. In *Aug.* 1687. I was deſired by a poor Woman, at *Aſtrop-Wells*, to look on her Daughter. They came from *Stow* in *Gloceſterſhire* (as they had often done before) for Work. The Daughter was about 21, of a Sanguine Complexion, and as to private matters well enough: She had been for ſeveral Days leſs active than uſual; and after that, had (a Week before I ſaw her) loſt her Speech, and the uſe of her Legs; ſhe had little or no ſenſe of Feeling in them, and the left Leg was drawn up as in a violent Cramp. Her Ruddy Sanguine Look directed Bleeding; but that did not relieve her. I then gave her Spirit of *Sal. Armon. Succinated*, Steel with Gentian, Amber, Caſtor, and other warm Cephalicks. A Bliſter was laid on her Neck. A Bath (of Wormwood, and other hot Herbs) prepared for her Legs; *Ung. Martiatum* uſed to anoint them after Bathing. By theſe Means, ſhe was in the ſpace of 3 Days able to ſpeak again; and in a little time, by the help of Crutches, able to go. But then omitting the Medicines, tho' but one Day, ſhe loſt her Speech again; and returning to them (eſpecially the Spirit) recovered it as ſoon. When not able to ſpeak, ſhe had a manifeſt alteration in her Face; the Strength and Tonick Vigour of it abated; her Eyes grew dull, her Lips pale. I have in this Juncture given her 30 Drops of the Spirit: In the ſpace of two Hours the Change has been ſurprizing; her Eye has quickn'd, a Colour come over her Face, her Speech return'd.

In *Jul.* 1688. her Mother brought her to me again, and told me, That after the Phyſick, I had (the Year before) preſcrib'd her, was all ſpent, her Speech, and the uſe of her Legs left her firſt in *September*, on a *Tueſday* about Noon, and return'd the *Saturday* following near the ſame Hour; and that from *Michaelmaſs* to the time of our Diſcourſe (which was *July* 18, following) her Speech and ſtrength of Legs obſerved the ſame period (of going off on *Tueſdays* every Week, and returning on *Saturdays*) with only two Exceptions, *viz.* That once they return'd on a *Friday*, another time not before *Sunday*. She added, That her Daughter was, the preceding Winter, very weak, and in danger of Death; that her Appetite was much abated; that ſhe ſometimes choſe to eat Bread, Water, and Salt, boyled together; that now, as the Summer came on, ſhe recovered ſome Degree of Strength;

that ſhe had loſt no Senſe at any time, beſides that of Feeling; which was by the firſt quantity of Medicines reſtored effectually, and without Relapſe. That the Menſes were regular as to Period, but as to Quantity unequal, and that when they were moſt ſhe was worſt. That before her Speech us'd to go off ſhe conſtantly loſt, for an Hours ſpace, the uſe of her left Arm; that when her Speech was leaving her, ſhe would ſtammer out ſome few words, and after this, on a ſudden, became mute: and that when not able to ſpeak, ſhe often moaned, and made a melancholy complaining Noiſe; that her Speech did uſe to return (as it went off) all on a ſudden, and at once. She always had, as her Speech ceaſed, and two Hours after it was gone, a Pain in her left ſide, including Arm and Leg; her left Foot was then drawn up, as before-mention'd: Her Face was high-colour'd when ſhe loſt her Speech, pale when it returned: no part of her Body wither'd, but the whole generally cold. Some time before ſhe was at firſt ſtruck Speechleſs her Hands uſed to tremble, but have been of late more ſteady: nor was ſhe now ſo dull and heavy as formerly; but for the generality more brisk and chearful than in her State of Health. When ſhe has her Speech ſhe goes beſt, but is always forc'd to uſe a Stick, being never able to go ſteadily: ſhe ſpeaks by intervals as diſtinctly as ever, and as loud; can ſing, when capable of ſpeaking, but at no other time.

I found that the Mother ſometimes had *Convulſive* Fits; and though a poor labouring Woman, was extreamly *Hyſterical.* And I obſerved the Daughter to have a pale ſickly Look; a heavy Eye, a low Pulſe; and to be much waſted in Fleſh. She continued in my Neighbourhood about 2 Months, and I ſaw her almoſt every Day for the whole time. I then repeated the former courſe, furniſhing her with large quantities of her old Medicines; and ſo diſmiſſed her, with Orders to let me hear again from her, when the Phyſick ſhould be all ſpent. Accordingly in *Sept.* 1688. ſhe came (with her Mother) from *Stow* to *Oxon* (that is almoſt 20 Miles) on Foot. I gave her a further ſupply of Medicines, and by the 10*th.* of *Nov.* following ſhe was grown ſtrong, and to all appearance well as ever. For two Months, then laſt paſt, ſhe did go and ſpeak every Day, but not at all times, of the Week; for her Speech left her (as formerly) on *Tueſdays*, but (now) returned the next Day after Noon. Thus ſhe continued to the Summer following; not ſpeaking (in more than 20 Months) on any one *Wedneſday* Morning.

In the *Summer* 1689. Hoping to compleat the Cure, I procured for her a large ſtock of Medicines for the Winter following; but from that Summer, to this of 1698, I have heard nothing more of her.

There were ſome of Opinion, that this young Woman counterfeited; but upon ſtrict Examination, I could never find any reaſon for that Suſpicion: and I beg leave to ſay, I think it was not in her power ſo to do.

An odd Convulſion in the Cheek; by Dr. Dawbeny Turberville. *n.* 164. *p.* 737.

IX. A Man came to me, who had a long time been troubled with a great Pain, and *Convulſions* in his Cheek; you might cover the place, where the Pain was, with a Penny: the *Convulſions* pull'd his Mouth, Face, and Eye aſide.

aſide. I applyed a Cupping-glaſs to the place; then I Scarify'd, and Cup'd him again; after which I put on a Plaiſter of *Diapalma*, and he was perfectly Cured.

A Periodical Convulſion; by Dr. W. Cole. n. 174. p. 1113.

X. Acri erat & lepido Ingenio cujus caſum refero Domina, formoſa, εὐσαρκὸς, interque Negotia domeſtica, quæ continuo eam exercitam detinuerunt, plurimum occupata, unde integra per multos Annos Valetudine potita eſt, plures licet enixa fuiſſet Liberos. Ante Sexennium vero abhinc prægnans, circa medium Geſtationis tempus, in *Hyſtericos* (neſcio qua πεῤῥάσει) incidit Affectus, qui quamvis illo tempore Remediis cedebant, ſubinde tamen recurrebant, licet non admodum frequentes. Tandem inſtante Partus tempore, poſtquam magis quam par erat (gravi id poſtulante Occaſione) ſeſe exercuerat, poſtridie (accelerato forſan aliquantulum Partus tempore) cum maximis doloribus parturire cæpit, magna effluente Sanguinis quantitate, Fœtu tamen nondum in Lucem emiſſo; donec labantibus viribus, totoque fere, prout aſtantibus viſum erat, excreto Sanguine, de Vita deſperatum fuerit. In Vitam vero quaſi revocata (Fœtu tandem, ſed mortuo, excluſo) brevi in *Convulſivos* incidit Affectus, qui, non obſtante Remediorum uſu, pertinaciter affligebant, per Intervalla licet, ad plures Menſes. Inde aliquanto melius ſe habuit, licet non in totum à præfatis Symptomatis immunis; quæ tandem aucta, non incertis, ut ante, Invaſionibus moleſta erant, ſed primo Tertianis, ſi rectè teneo, Periodis, dein Quartanis, & non ita multo poſt Quintanis (*h. e.* ut Quatuor integri dies intercederent inter ſingulorum Paroxyſmorum initia) invadebant; idque exacte adeo, ut non certius Horologiorum Indices ad notatas figuras redeant, quam iſti Paroxyſmi ſuos repeterent Curſus. Incipiebant cum Oſcitatione, aliquali Rigore, & magna Urinæ Limpidæ quantitate excluſa; dein ægrotans ſtatim *Convulſa* opus habuit ut aſtantium manibus prehenderentur ejus manus, ſecus vel Veſtes vel Faciem dilacerabat, multoque niſu Dentibus petebat prehendentium manus, Mente omnino Capta, & Aphona. Poſtquam per horam unam vel alteram hoc modo *Convulſa* perſtitiſſet, Urinæ Limpidæ magna copia identidem reddita, ſenſim evanuit Paroxyſmus, obrepente Somno, qui per plures horas perſeverabat; tandemque, omnium quæ in Paroxyſmo tranſacta erant neſcia, ad ſe rediit. Reliquis tribus diebus, quamvis à Paroxyſmo libera, admodum tamen debilis, & enervata erat, ut vix è lecto vel Sedili ſurgere, nedum cameram obambulare abſque miniſtrantium Satellitio, potuerit.

Curationem accerſitus aggreſſus ſum Medicamentis Teſtaceis & Sp. C. Cervi; Indicationem ſumens à magna illa Urinæ Profuſione, & *Nervoſi generis* Affectibus, quæ inſignem & Sanguini, & Succo *Nervoſo*, Acorem impreſſum fuiſſe mihi fidem fecerunt. Verum cum pertinaciter, his non obſtantibus, hærerent Paroxyſmi, ſtatiſque redirent Periodis, in Mentem venit, iſtos non aliter tractandos, quam ſolent Febrium Intermittentium. Quamvis enim non tantum præ ſe ferrent Calorem, quantum Febres Vulgares Intermittentes; cum tamen regulariter adeo, uti mos eſt iſtiuſmodi Febrium, procederent, cumque inſuper non omnes Intermittentes, propriè ſic dictæ, eundem obſervent Caloris modum, omnes tamen eodem Remedio, *Cortice* ſc. *Peruviano*,

 debellen-

debellentur ; ſtatui Famoſiſſimo illo Specifico hunc Affectum aggredi, (intercalatis tamen Medicamentis ſupra memoratis) utpote quoniam altè mihi inſederat Notio dicta de Acida Succorum Dyſcraſia: nec fefellit Eventus ; poſtquam enim duas vel tres iſtius *Corticis* Doſes ante totidem Paroxyſmos, pro more tunc temporis (mihi ſaltem) ſolenni, exhibueram, ſenſibiliter ferociam ſuam depoſuerunt; tandem continuata ejuſdem Exhibitione prorſus evanuerunt, nec, quantum mihi reſciſſe contigit, poſtmodum redierunt.

A Periodical Diſeaſe of the Convulſive kind; by Dr. Will. Cole. *n.* 174. *p.* 1115.

XI. *Dorothea Cook* Vidua, ſexagenaria, Coffepola *Vigornienſis*, à 36 Annis (triduo poſt Nuptias) *Epilepticis* nulla notabili προφάσει corripi cæpit ; qui quamvis ſub Morbi initium frequenter, nullo tamen ordine, recurrebant. Invaſio tam ſubita erat, ut quæ & aliis & ſibi perfecte ſana videbatur, nictu oculi in humum, mente protinus orba, concidere ſoleret: Quo in ſtatu, poſtquam velut exanimis, nullis agitata *Convulſionibus*, per aliquot horæ Minùta jacuerat ; diſcuſſa tandem nebula ad ſe rediit. Aliquot poſt Menſes, circa Plenilunium & Novilunium, imo ſæpius in die iſtis temporibus, invadebant Paroxyſmi, & ad duos vel tres dies recurrere perſeverabant ; reliquo Interlunii tempore bene habuit. Poſt pauculos inde Menſes, qui prius duarum fere Septimanarum obſervaverant Periodum, tandem bis intra ſingulas, ſed inæqualiter æquali Diſtantia, diebus *ſc.* Jovis & Saturni, Curſus ſuos repetebant. Brevi poſt Nuptias gravida facta eſt, Fœtumque ſolito tempore peperit, qui non ita multo poſt *Epilepticus* Fato functus eſt ; Secundus item Partus eodem modo periit : ſed licet plures poſtmodum utriuſque Sexus liberos enixa fuerit, nullus tamen eorum ad hunc uſque diem vel minimum ejuſmodi Affectus inſultum perpeſſus eſt.

Per tres circiter Annos memorato ordine (variis licet tentatis Remediis) invadere perſiſtebant Paroxyſmi, donec tandem *Empirici* cujuſdam pluriinum decantato, neſcio quo, Remedio diſparuerint, nec per aliquot Menſes redierunt; uſque dum novi Terroris occaſione (ante potius, ut videtur, ſopiti quam perſanati) recruduerint. Hinc ad idem Remedium iterum confugiebat : ſed quod pridem tantopere profuerat, nunc nil levaminis attulit. Nihilominus ſecunda vice doctiſſimi, perque multos Annos apud *Vigorniam* merito Celeberrimi, D. *Johnſon* (nuper Defuncti) ope à Morbo brevi convaluit, atque ſana perſtitit aduſque famoſum *Vigornienſe Prelium*, *A.* 1651. dimicatum ; quando, capta à *Cromwellio Vigornia*, dum ubique Mors & Horror ſæviebant, ipſa (non ſecus ac cuncti præterea Incolæ) immani Terrore perculſa, priſtinorum Inſultum Paroxyſmorum iterum ſubiit ; qui exinde irregulariter primo, & frequenter invadebant, poſtea ſenſim ad veterem redibant Periodum. Dehinc varia, & à præfato D. *Johnſon*, & ab aliis, uſurpavit Remedia, ſed incaſſum omnia. Poſtquam per biennium inde Typo iſthoc recurrere perſtiterant, tandem præ Conſternatione iterata diem Invaſionis mutarunt, atque primum bis Hebdomadatim, tandem ſola die *Dominica* (commotionis anſa iſthoc die forte-fortuna oblata) ad hoc uſque tempus invaſerunt. Cujus quidem Periodi, & Symptomatum, progreſſus ſequenti modo ſe à tot Annis habet.

Die

Die *Jovis* circa Veſperam invadere incipit dolor in Vertice, nec non pulſativus circa Oſſis Sacri regionem, qui die. *Veneris*, altius paulatim ſerpens, medium occupat Dorſum: Veſperi diei *Saturni* immanior evadit (multum etiam urgente Siti) & pauculis, poſtquam ſe in lecto compoſuerit, horis ad humeros uſque ſenſim auctus aſſurgit; quo ubi pertigerit, quæ prius interdiu domeſtica obire valuerit munia, nunc ſeſe vix omnino in Lecto commovere audet; quod ſi, niſi admodum caute, ſategerit, extemplo Paroxyſmum (ſecus non niſi poſt plures horas invaſurum) eumque multo ſeveriorem, certo accerſit. Parum hac nocte, præ dolorum moleſtia dormit, qui Caput nunc atrocius infeſtant: Horum Cruciatus mane in turbulentam Somnolentiam tranſit, cujus etiam cauſa toto die *Dominico* à lecto abſtinere nequit; nempe matutinis Horis dormitat quidem, ſed inquietè, atque aliquotics è Somno expergiſcens potum expoſcit, quo ſumpto ſe iterum Somno tradit. Hora circiter 12. ſi non ſponte evigilet, aſtantium interpellatione excitatur, ciboſque monita ſumit, rerum omnium circa ſe tranſactarum adhuc probe conſcia: dein ſtatim in Somnum relabitur (niſi verius Animi torporem dixeris, quippe nec excitari amplius poteſt, nec cujuſvis rei nunc actæ memoriam retinet) cum frequenti Corporis in lecto jactatione, quoad ſextam præterpropter horam veſpertinam detinetur. Hac hora ingruunt *Convulſiones* ſed interpolatæ, ad horas quinque eam exercentes; quæ primo mitiores, tandem circa horam undecimam maxime violentæ evadunt; per quarum Intervalla oblatam Allam (tenuiorem enim potum ipſa, dum mente conſtat, vetat ſibi in Paroxyſmo porrigi, noxam inde Ventriculo imprimi experta) avide haurit. Elapsâ hac horâ redit, qua per tot horas caruit, Mentis uſura, omniumque deinceps agendorum notitia, verum reliqua Noctis parte ſe irrequieta in cubili jactat, prorſus inſomnis. Die *Lunæ*, circa horam 9 matutinam, lecti tædium non amplius tolerare valens, ex eo ſurgit, ſed toto die univerſo Corpore dolet; & quamvis hoc die ſat libere domum ſuam obambulet, juriſque nigri pocula Hoſpitibus propriis manibus miniſtret, Artus tamen rigidos quaſi, adque motum parum aptos queritur, qui tandem Somni placidiſſimi, ſequenti nocte obrepentis, mulcedine torporem deponunt (nulla tamen accedente, ſive per Sudorem, ſive Urinam, ſive alio quocunque modo, ſaltem ſenſibili, critica Evacuatione; ut pronum mihi ſit conjectare, Materiam ex *Cerebro* detruſam à Sanguine reſorberi, in Fermentum pro novo Paroxyſmo excitando denuo maturandum) duorumque hinc vel trium dierum Induciæ conceduntur, donec novo aggeſto Fomite eadem denuo adornatur Symptomatum Scena. Nulla à multis retro annis admittere voluit Remedia, utpote eorum infructuoſa adminiſtratione tamdiu, ante hac laſſata. Unum præterea ſatis rarum occurrit, quodque forte mente eam minus conſtare ſuſpicionem daret, niſi ubique notum eſſet, Nervoſo Genere affecto, notabiles inde Impreſſiones in Animum fieri: Nempe à longo tempore perſuaſam habuit ſe, ſi extra fores ſe proriperet, Paroxyſmo confeſtim tentandam iri, proinde ſe intra proprios Parietes continenter per aliquot Annos clauſit; cum vero ante 20 Annos præ importuna Solicitatione vicini cujuſdam Ædes cœnatum adiret, ſtatim atque in illas ſe receperat, in eum, prout mens ominata fuerat, extra uſitatam Periodum incidit, ut neceſſe habuerit Domum repor-

reportari, ubi ſolito graviorem perpeſſa eſt. Exinde nunquam extra Limen ſuum exceſſit, niſi cum Ædes ante 18 Annos (in Cathedra deportata) novis mutaret, quo momento, licet haud ſtato recurſus die, invaſere Paroxyſmi perque 10 dies continuos, bis in ſingulis invadentes, perſiſtebant, donec tandem ad ſolitum redierint tenorem; Veruntamen pedem unum extra limen imo totum Corpus, modo Pollicis pedis ſummum apicem intra limen detinuerit, exerere & audet & ſolet; integro autem Corpore vel latum Unguem inde excedere nec audet, nec ullo pretio obtinueris, non ſi Talentum obtuleris. Cum olim Famoſus ille Chiriater *Greatarakſius Vigorniæ* ageret, ad hanc adductus eſt, ut quid in tam raro affectu valeret ipſius Manus experiretur: Illa autem, audito hunc eo conſilio appuliſſe, nondum tamen viſo, in graviſſimum Paroxyſmum incidit, qui non ante Septimum ab Inſultu diem eam deſeruit. Interea toto hoc tot Annorum Curriculo nullam extra Paroxyſmos vel Intellectus, vel Functionum cæterarum Animalium, notabilem Læſionem paſſa eſt, quin (cum bono, adque pinguedinem vergenti, Corporis habitu, vultuque floriđo) non minus expedite, pro ratione ætatis, negotia domeſtica, adque eam quam exercet Vocationem ſpectantia, exequi videtur, quam ſi nullo omnino, præcipue Capitis, Morbo laboraverit.

Diſcoveiers in the Optick Nerve; by S. Malpighi. n. 27. P. 491.

XII. S. *Malphighi* having Diſſected the Head of a *Xiphias* or *Sword-Fiſh*, which hath a very big Eye, obſerved that the middle of the Optick Nerve is nothing elſe, but a large Membrane, folded according to its length in many doubles almoſt like a Fan, and inveſted by the *Dura Mater*. This Structure of the *Optick Nerve* is only to be found in the Eye of Fiſhes. For that of an Ox, Pig, and other ſuch Animals, is nothing but a Heap of many ſmall Fibres of the ſame ſubſtance with the Brain, wrapp'd about with the *Dura Mater*, and accompanied with many little Veſſels with Blood. Hence it appears that there muſt be many Cavities in this *Nerve*; for as much as the ſmall Filaments, of which it is compoſed, cannot be ſo cloſely joyn'd, that there ſhould not be ſome void ſpace betwixt them.

A Man who becomes blind after Sun-ſet; by Dr. Pet. Parham. n. 159. P. 559.

XIII. 1. I was lately in *Suffolk* where I met with a Young Man, about 20 Years of Age, who all the Day hath a good ſight, and diſtinguiſheth Objects at all Diſtances as well as any Body, and with as much Vigour and Unweariedneſs; but when Twilight once comes he is quite Blind, and ſees nothing at all; ſo that he cannot without great Difficulty direct himſelf abroad, or even at Home by the Lights of the Fire or Candle.

I view'd the Boy both by Day and Night: But there is no Diſeaſe in the Organ that can be obſerv'd; no *Vertigo* or Diſtemper in the Head to interrupt or any way intercept the Spirits in their Motions, but to all appearance the Fabrick of the Organ is very true and exactly well, and never diſturbed with Fluxes any way. I try'd him with Spectacles for variety of Sight, but they did him no ſervice either by the Lights of Fire or Candle. He tells me, That he was thus from the firſt time he was able to take notice of things, and it came without Diſtempers; That this Cloudineſs comes gradually upon him like a Miſt, as day-light declines;

clines; That he is always alike in all *Aſpects* of the *Moon*; He feels no Pain by Fire or Candle Light; He finds himſelf no worſe in Winter then Summer; and obſerves no Miſchief upon taking Cold; He ſweats much at Work, but finds no difference as to his ſight in thoſe Days when he works hard or not.

2. The Caſe now mention'd (though indeed in a different Senſe from that of *Hippocrates*) is called by many Writers *Nyctalopia*, or *Nocturna Cæcitas*, and is accordingly deſcrib'd by them with the Remedies for it. *Cornelius Celſus* mentions it under the title of *Imbecillitas Oculorum.* *By Dr. Will. Briggs. ib. p. 562.*

3. Vulgo notum, quod interdiu quam plurimi Vapores, à Sole rarefacti, attolluntur, qui deficiente Calore poſt ejus occaſum à Frigore denſati deſcendunt; quodque inde Aer præcipuè prope Terram ſit ſpiſſior. Ad eundem modum forſan Humores in *Oculo dicti Juvenis* afficiantur; uti & Veſpere ab iſtis Vaporibus aliqnantulum ſpiſſiores vel magis turbidi facti ſint: Sicut Urinis ſæpe accidit, quæ prout Frigori vel Calori admoventur, turbantur vel clareſcunt: Dum Sol agit ſupra Horizontem, vi Caloris ſui, amotis Vaporibus denſatis, clareſcunt Oculorum Humores; at cum Horizontem ſubit, (à Cauſa contraria) Humores turbantur, atqueinde recta illa, quæ requiritur, Diſpoſitio Oculorum immutatur: Nam ex ſpiſſitudine illa Humorum, Radii retuſi vel refracti, ad *Retinam* vix pertingunt; vel ſi pertingant, agunt cum Impulſione nimis debili. *A Solution of this extraordinary Caſe; by Dr. Will. Briggs. n. 166. p. 804.*

Huic Hypotheſi apte conveniunt omnia quæ enumerantur Phænomena. Primo enim ſemper à Cunabulis prædicto Juveni contigit hic Affectus, ſine defluxione, vel alio aliquo Oculorum Morbo; cujus Cauſa eſt eadem peculiaris innata Humorum Diatheſis, qui poſt ſolis Occaſum à Vaporibus, ut ſupra, ſimili modo afficiebantur. Secundo Cæcitas hæc gradatim obrepſit, à Vaporibus poſt ſolis Occaſum gradatim deſcendentibus. Tertio ab Influxu Lunæ nulla immutatio, quoniam Aſcenſus & Deſcenſus Halituum de Influxu iſtius Planetæ non pendent. Quarto ſuſpicor intimos Humores (nimirum *Chryſtallinum* & *Vitreum*) adeo eſſe viſcoſos, ut (clareſcente *Aquco*, Tunicaque *Cornea*) nequaquam diſſipantur. Quinto Cæcitas nec major nec minor vel in Hyeme vel Æſtate; ratio videtur, quoniam licet dicti Vapores non ſemper pari copia deſcendunt, tamen ſemper tanta Copia ut eundem effectum producere poſſint: Sicut aliquando vidi Aquas quaſdam acidulas in Vicinia noſtra Foliis quibuſdam Quercus contuſis & infuſis purpuraſcentes, at Color à fortiori Infuſione non intendebatur: Ita Veſpere ſemper ſatis Vaporum deſcendentium ad Effectum producendum; at ſi plus ſatis, nulla immutatio.

Alius aliter ſentit, quod cum nulla in prædicti Juvenis Oculis obſervetur Nubecula aut Obfuſcatio, rarioris hujuſce φαινομένου ratio probabilior petenda eſt à Diſpoſitione *Nervi Optici*, cujus tubuli influxu Solari repleti, Species (quas vocant *Viſibiles*) facillime admittant; eodem autem deſtituti, flacceſcunt; & ad Viſionem inepti redduntur.

XIV. One *Daniel Wright*, aged about 19 Years, and of a Sanguine and Plethorick Conſtitution, about the end of the Year 1683 was ſeiz'd with a Dizzineſs, and Pain in the upper part of the Head, which he told me, he could *A Duplicity of Viſion, and a Gutta Serena after great Pains*

in the Head and Convulsive Fits; by Dr. Briggs. n. 159. p. 563.

could impute to nothing but the excessive Cold Weather, which then rag'd with us to extremity. Hereupon having the Misfortune to apply himself to an Ignorant Pretender to Physick here, a Plaister for his Head was only ordered at that time without any Evacuations. The Patient upon this grows much worse, the Pains of his Head more fixt and girding (I suppose from some Spasms or Constrictive Motions of the *Meninges)* to which succeeded Convulsive Fits (which were accompanied afterwards with a Tremor upon his Arms and Legs) and upon this, all Objects appear'd double to him, from the Fibres of the *Optick Nerves* being thus distorted from their wonted Parallelism. After he had been thus tormented about 3 Months, he was taken into St. *Thomas's-Hospital.* Upon his Admission I examin'd his Case, and judg'd that the *Optick Nerves* were affected, and that it was gone so far that it would probably end in a *Gutta Serena*. However we endeavour'd by all the ways we could to relieve him. Accordingly we order'd the *Cephalic Pills*, and an *Electuary* (which we use in the Hospital in *Epileptick Cases*) which he received much Benefit by; he was also (by Intervals) bled in the *Jugulars*, and in the *Hæmorrhoids*, and by Leeches, which also gave him good Relief; his Head was shav'd, Blisters apply'd to his Neck, and a Seton made some time after, *&c.* we endeavouring by all manner of Revulsions to drive the Humour another way, if it were possible. But it was too much fixt, so that about two Months after he had been under our Care, a *Gutta Serena* seiz'd on his Right Eye, that he could not see at all on that side; but then the Duplicity ceased, and he saw all Objects single again as before.

Whilst we were sollicitous about preserving the Left Eye, which was still in danger, a severe Fit seiz'd him, soon after which he died. I mist the opportunity of Opening the Body; but I was told, that in the upper part of the Head, Neck, and Shoulders, a great Blackness appear'd, not long after he was dead, from the settling of the Blood, I suppose, in those Parts.

Several Remarkable Cases relating to the Eyes; by Dr. Dawbeny Turberville. n. 164. p. 736.

XV. 1. The Disease which I call *Bursa Oculi*, or the Pouch of the Eye, is a Bag without Matter in it, (like an empty Purse) on the White of the Eye, under the upper Lid; it hung flag about the length of a Thumb-nail.

2. Another Person had no visible Disease in his Eyes, but could not see at all unless he squeezed his Nose with his Fingers, or saddled it with narrow Spectacles; and then he saw very well.

3. A Maid about 23 Years Old, came to me from *Banbury*, who could see very well, but no Colour beside Black and White. She had such Scintillations by Night (with the appearances of Bulls, Bears, *&c.*) as terrify'd her very much; she could see to read sometimes in the greatest Darkness for almost a quarter of an Hour.

Ib. p. 737.

4. A Saddler's Daughter of *Burford*, had an Impostume which broke in the corner of one of her Eyes; out of it there came about 30 Stones as big as Pearl, and splendid; after which she had a *Fistula*, which I cured.

5. Here was one in *Salisbury*, who had a piece of Iron, or Steel, stuck in the *Iris* of the Eye; the Person was in very great Pain, and came to me; I endeavoured to push the Iron out with a small *Spatula*, but could not; I

then

then apply'd a Loadſtone to it, and immediately it jumpt out.

6. I was conſulted by a Maid who had a Puſtle broke in her Eye, out of which there came fine ſmall Sand, like Chalk, for many Weeks together: I made uſe of Purging, Fumigation, and ſome Topicks, by which ſhe recover'd her ſight in a very great meaſure. *Ib.* p. 738.

7. About 6 or 7 Years ago, I had one Mr. *Oyliff* in Cure of his Eye. It was as big as my Fiſt, black, fleſhy, and full of blewiſh Bladders; this I judged to be a Cancer. After Purging and Bleeding, I cut out the Ball, and ulcered Fleſh, by many Cuts, which were all inſenſible to him, till I came to the *Optick Nerve*: at the laſt Cut he complain'd, and bled a little; the Wound was heal'd in about a Fortnight. n. 167. p 839.

8. A young Man, my Patient, had an Eye as big as an Hen's Egg, very fair, without Blemiſh, Rheum, or Redneſs; and his Sight was pretty tolerable; I judged theſe Symptoms to proceed from thin Humours fallen on the Eye, and extending its Coats: I cured this Diſtemper by applying drying Medicines to the Head and Eyes, and making an Iſſue in *Nucha*; *Appello Morbum* Oculum Bovinum, *ſive* Oculi Hydropem.

XVI. When I was not above 60 Years of Age, my Sight was ſo much decay'd, that I ſeem'd always to have a kind of thick Smoak or Miſt about me, and ſome little black Balls to dance in the Air before my Eyes; I could not diſtinguiſh the Faces of my Acquaintance, nor Men from Women, nor keep the plain trodden paths except I was led. I received no benefit by any Glaſſes, but was in the Caſe of thoſe whoſe decay by Age was greater than can be helped by Spectacles. The faireſt Prints ſeem'd through Spectacles like blind Prints, little Black remaining. But I found great help by the following Expedient: I took Spectacles that had the largeſt Circles; cloſe to the Semicircles, on the over part, on both ſides, I cut the Bone; then, taking out the Glaſſes, I put black Spaniſh-Leather taper-wiſe into the emptied Circles, which widen'd enough (together with the increaſing wideneſs of the Leather,) took in my whole Eye at the wider end; and preſently through the ſmaller end I could read the ſmalleſt Prints that are, as if they had been a large and fair Character. I made theſe empty Tubes of different lengths, and the ſmaller ends of different bigneſſes: I can only put the very end of my little Finger into the Orifice of the leſſer, but the ſame Finger ſomewhat deeper, yet not quite up to the firſt Joynt, I can inſert into the Orifice of the wider. *An eaſy Help to a decayed Sight; by*..... *n.* 37. *p.* 727.

The Tubes may be of Paper only coloured Black, and paſted on, and with the inner folds to be drawn out from one Inch to three; ſome of the folds to be taken out, that the Orifice may be wider or narrower, as beſt fits to every degree of Defect.

Probably, theſe Tubes may be proper for ſome that are Squint-eyed, whoſe Eyes do interfere; but certainly they will eaſe them that cannot well bear the Light, and perchance they will preſerve the Sight for longer Durance.

After I had uſed theſe Tubes little more than a Week, I could uſe them without much trouble all the Day long; and my Sight was ſo much

amended, that I could ſee the Greenneſs of the Garden, and Paſtures in a florid Verdure, whereas before the uſe of them, all dark Colours had the ſame Hue to my Eye.

n. 39. *p.* 765. I have ſometimes put Convex-Glaſſes (for a Tryal) into my Tubes; but I found the Prints, tho' ſomething larger, yet not ſo clear, ſo diſtinct, nor ſo pleaſing to the Eye, as when I uſed the empty Tapers. I find my ſelf beſt at eaſe with thoſe Leathern Tubes that are made without any faſtening to the Bone of the Spectacles; for as they hang in that ſlight manner, I can with a touch of my Finger raiſe them up or bow them down, divide or unite them, to take in the ſame Object.

n. 40. *p.* 802. I found at firſt a great Diſcouragement in the difficulty of uſing them, ſo that I could not endure the Trouble above 2 Hours at a time: But by the Practice of a Week or a Fortnight, I found them an Eaſe and Pleaſure to me for 12 at leaſt of each 24 Hours. And by all the Tryals which I have yet made upon others, whether *Pore-blind*, or of faint Sight decay'd by Age, or however weaken'd, it proves a very great Aid. For the *Pore-blind* they muſt be made ſhorter: For the decay'd by Age, they may be longer.

An Experiment concerning Deafneſs; by Dr. W. Holder. n. 35. *p.* 665.

XVII. A Young Gentleman, who was born *Deaf*, and continued Dumb till his Age of 10 or 11 Years, was committed to my Care. His Mother when ſhe was great with him, received a ſudden Fright; by Occaſion whereof, the Child's Head and Face were a little diſtorted, the whole right ſide (as I remember) being ſomewhat elevated, and the left depreſs'd; ſo that the Paſſage of his left ear was quite ſhut up, and that of the right Ear proportionally diſtended, and too open. I found, upon Examination, that the *Auditory Nerve* of this right Ear was not periſht: And I ſuppoſed the Defect to lye in the want of due Tenſion of the *Tympanum* of his Ear; whoſe uſe I took to be only to preſerve the *Auditory Nerve*, and Brain, and inward parts of the Ear, from outward Injury by Cold, Duſt, *&c.* For it is requiſite that the *Tympanum* be Tenſe and hard ſtretched; otherwiſe the Laxneſs of that Membrane will certainly Dead and Damp the Sound. The Tenſion of this part is the Principal Office of the 3 *Oſſicles, viz.* the *Malleus*, *Incus*, and *Stapes*; whereof the *Stapes* is fixt to the inner Bone, and part of the *Malleus* to the *Tympanum*, and the *Incus* between them joyn'd on one part to the *Malleus*, and on the other to the *Stapes* by *Ginglymoide* Joynts, and by the help of a Muſcle drawing the *Incus*, theſe 3 Bones are brought to a Curv'd or Arched Poſture, and the *Stapes* being fixt unmoveable the *Malleus* yields, to bring the Terms of that Line nearer, in proportion as it is curved, and draws the Center of the *Tympanum*, ſtretching the ſurface of it from a Plain to a Conoide Figure, within the ſame Circumference. And I conceive the Action of this Muſcle does ordinarily and conſtantly draw the *Tympanum* to a moderate Tenſion; but when we have Occaſion to liſten, and give a more particular Attention to ſome ſound, the Action of that Muſcle is then more Intenſe, and the *Tympanum* is drawn to a more than ordinary Tenſion, ſo to facilitate the Paſſage of the Sound.

Upon

Upon theſe Conſiderations I adviſed his Mother to conſult with Phyſicians if by ſome Aſtringent Fumes or otherwiſe it might be reſtored to a due Tenſion. In the mean time I thought of a Temporary way by the Impulſe of any Vehement ſound; as of a Drum beaten near him: which ſound, during its continuance, muſt needs give the *Tympanum* a Tenſion, by driving and ſwelling it inwards, as a freſh Gale of Wind fills the Sails of a Ship; and the Experiment ſucceeded according to my expectation. For ſo long as I beat a Drum faſt and loud by him, he could hear thoſe that ſtood behind him, calling him gently by his Name (which he underſtood, having learned to ſpeak and pronounce it among other Words;) and when the Drum ceaſed, he did not hear the ſame Perſons, when they again very loud call'd him by his Name. And this we tried ſeveral times, by beating the Drum again, and ceaſing it; and he ſtill heard them when the Drum beat, and heard them not when it ſtopt.

Having mentioned this Experiment to a Gentleman about *Oxfordſhire* in a great Degree of Deafneſs, he call'd to Mind that he never heard ſo well and eaſily, as when he was Diſcourſing with Company in a Coach, whilſt it went faſt, and made a great rumbling Noiſe in *London* Streets; by which he was induced to believe, that the Impediment of his Hearing was of the like Nature with the other.

The Organ of Hearing; by Dr. Raymund Vieuſſens. n. 258. p. 370.

XVIII. In Structura interiori *Organi Auditus*, imprimis animadverti, Membranam tenuiſſimæ raræque admodum Texturæ intra Cavitatem *Tympani* eſſe: Hanc, habita ratione Loci quem occupat, interiorem Membranam *Tympani* nuncupo, ut ab ea diſtinguatur quæ *Meatus Auditorii* finem extremum obturat, & quam exteriorem ipſiuſmet *Tympani* Membranam nominare placet. Hæcce Membrana, ſi attentè perſpiciatur, in utraque Aure Vaſis capillaribus penè infinitis apparet irrigata, quæ *Carotis Arteria*, & *Vena Jugularis* utriuſque lateris ipſi largiuntur. Hinc fit, ut Vaſculis, quibus irrigatur, Sanguine ſupra modum turgentibus, tota ferè rubra videatur, cum Radiorum Solarium Interventu, ac præſertim Microſcopio intermedio exploratur. Ejuſmodi Vaſcula impediunt ne Membranæ, qua ſuffulciuntur, partes, ſuperna ſcilicet & laterales, in ſemetipſas corruant, & complicentur, uti procul dubio corruerent & complicarentur, niſi eas ſuſpenſas tenerent; quoniam per ſeipſas interiori Superficiei hujus, qua continentur, Cavitatis immediatè non adhærent.

Hæc ipſamet Membrana, quæ eſt productio Membranæ tenuis interiora *Aquæductus* inveſtientis, Os Speciei cujuſdam ſpecus occludit, quà itur ad Foveolas intra *Maſtoidem* Apophyſin excavatas; proindeque impedit nè concluſus in iis Aër, libere ſaltem, cum Aere *Tympanum* ſubeunte communicet; ac præterea tenuiſſima ejus productio una *Stapedis* aperturam, altera verò Foramen vulgò Rotundum nominatum, obturat, & ulterius extenſa toti ſuperſternitur interiori Superficiei exigui hujus Spatii cavi, quod à Foramine Rotundo extenditur ad extremum uſque finem Ductus Semi-ovalis Spiralis Cochleæ, & uſque ad Rimulam inciſam Baſi Conchæ. Ita ut interior *Tympani* Membrana hac productione ſuâ intermediâ, qua ſcilicet extremitatem Ductus

Semi-ovalis Spiralis Cochleæ, & Rimulam Baſi Conchæ inſculptam, extrinſecùs occludit, communicet cum hac portione Membranæ Nerveæ interioribus Conchæ Parietibus ſuperſtratæ, quæ Baſeos Conchæ ejuſdem Rimulam intùs claudit, & cum extremitate Laminæ Nerveæ Spiralis, quæ intra Ductum Semi-ovalem Spiralem Cochleæ reconditur. Præterea Membrana, de qua nunc agitur, ſubtus illam ſui partem, qua externam *Tympani* Membranam reſpicit, ſat amplum relinquit ſpatium vacuum, quod *Aquæductu* ad ſe delatum Aërem extrinſecum admittit: interea hæc in ſemetipſam ita convolvitur, & complicatur, ut intra eam tres formentur Cavitates. Prima hujuſmodi Cavitatum occupat ſpatium, quod externæ *Incudis* Apophyſi, & huic interjicitur Specui, quà itur ad Foveolas Apophyſeos *Maſtoidis*, ut ſupra dixi: Secunda primæ & tertiæ intermedia, iiſque minor, præcisè Baſi *Conchæ* Subſternitur, & *Malleoli* Caput, nec non fermè totum *Incudis* Corpus, intra ſe recondit: Tertia omnium ampliſſima internum *Aquæductus* Orificium reſpicit, & intra ſe continet Ventris primi Auris internæ Muſculi & *Incudis* portionem unà cum binis illius Apophyſibus, *Stapedem*, *Os Lenticulare*, Tendinem ſecundi Auris internæ Muſculi, & Cervicem unà cum Manubrio *Malleoli*.

Demum Membrana de qua nunc loquor, in quibuſdam tantum Hominibus ita conformatur, ut parva illius portio in Membranulam tenuiſſimam abeat, qua dimidium circiter ſpatium tertiâ nec non maximâ Cavitatum ejus comprehenſum in duas partes velut Septo intermedio dividitur. Ejuſmodi Membranula à nullo Anatomico, quod ſciam, hactenus deſcripta, in omnibus fere Hominibus deſideratur, & in iis, in quibus reperitur, ſuperna ſua parte Baſi Conchæ, & inferna exteriori *Tympani* Membranæ *Meatus Auditorii* finem extremum occupanti, & obturanti alligatur, eamque in binas partes fermè equales ex tranſverſo ſecare videtur, ad extremum uſque finem Manubrii *Malleoli*, cui adhæreſcit, imo & paulo ultra. Ita ut Membranula iſta unà cum extremo fine Manubrii *Malleoli* mediam partem Exterioris Membranæ *Tympani* verſus interiora Cavitatis ejus attrahat, eamque ita inclinet, ut è regione *Meatus Auditorii* parum concava, & è regione Cavitatis *Tympani* parum convexa ſit. Hæc Membranula apta nata eſt quæ, in Hominibus in quibus non deſideratur, impediat ne validioribus Muſculi Monogaſtrici *Auris* internæ Contractionibus exterior *Tympani* Membrana ſupra modum diſtendatur, vel extremitate Manubrii *Malleoli* dilaceretur, cum prædictus Muſculus Convulſione, vel Motu convulſivo, afficitur. Ita ut hæc Membranula vices quodammodo ſupplere videatur Muſculi Antagoniſtæ Muſculi Monogaſtrici, de quo nunc dixi, ſi ſpectetur quatenus tendine ſuo gracili & & longo agens, ut ex dicendis in ſequentibus patebit.

Si quis horum omnium perſpiciendorum jucunda Curioſitate frui velit, *Os Petroſum* ſecernat à reliqua Calvaria Hominis Strangulati, vel *Phrenitide* aut *Apoplexia* perempti, ſi fieri poſſit: Os illud à reliqua Calvaria ſecretum per biduum in loco Sicco Servandum, ut per id tempus Membrana, quam nunc deſcribo, parum exſiccetur, adeoque in ſemetipſam contrahatur, ut, quantum par eſt, ſecedet ab interna Superficie Cavitatis, intra quam continetur, nè ab Anatomico illius Texturam penitus exploraturo dilaceretur. Poſtea Os ſat tenue, quod ſupernam *Tympani* partem conſtituit, fruſtulatim Cultro peritè

ritè ſecandum, & auferendum eſt. Et verò cum primùm ſuperna *Tympani* pars ſecta & ablata fuit, Membrana, de qua nunc, intra Cavitatem illius antea latens, Oculis ſubjicitur, & adeo numeroſis Vaſis capillaribus irrigatam ſeſe prodit, ut hæc, cum ſingula ejus Vaſa repleta ſunt Sanguine, ſpeciem quandam *Retis Mirabilis* repræſentet.

Membrana jamjam deſcripta mirabilibus ſanè muniis præſtandis, & mox deſignandis, dicata eſt. Imprimis hæc qua tenui productione ſua occludens *Labyrinthi* januam impedit rè naturalis puriſſimus ac ſubtiliſſimus Aër intra diverſas Cavitates, diverſoſque illius Mæandros latens Communicationem, ſaltem valde liberam, habeat cum Aere craſſo, qui *Tympani* Cavitatem *Aquæductu* ſubit. 2°. Hæcce Membrana miti Calore Sanguinis Vaſorum, quibus adornatur, oſſeam *Labyrinthi* totius Baſin leniter calefacit, & uno eodemque tempore fovet atque conſervat Motum Aeris in binis Veſtibulis, flexuoſiſque omnibus illius Ductibus concluſi, & Lymphæ defæcatiſſimi Animalæ Spiritu imprægnatæ, qua ſingulæ Nervi Mollioris Auris Propagines inferius deſcribendæ imbuuntur. 3°. Eadem Membrana intra Cavitates ſuas Aërem benigno Calore Sanguinis Vaſorum ſuorum maximè rarefactum continet, qui utpotè maximè rarefactus, atque adeo tenuiſſimus, & magna Æthereæ Materiæ Copiâ imprægnatus valde aptus eſt, qui Corporum omnium Sonororum Impreſſiones facilè recipiat, eaſque citiſſime ad Aërem, & ſingulas Propagines Nervi mollioris Auris interiora *Labyrinthi* adornantes, nec non ad ovale Cerebri Centrum tranſmittat.

Ex iis, quæ modò diximus, planè ſequitur Membranam, de qua nunc agitur, Auditui producendo mirum in modum conducere: Ita ſanè hæc, utpotè valde tenuem raramque Texturam habens, liberum in Cavitates ſuas introitum, pariterque liberum ex iis egreſſum præbet Sonororum Objectorum Impreſſionibus, quæ cum primùm Aeri Caput ambienti communicatæ fuerunt, Æthereæ, qua gravidus eſt Aer, materiæ motu, & Membranæ exterioris *Tympani* innumeris Foraminibus inſenſibilibus perviæ, nec non *Aquæductus* interjectu ad ipſam tranſmittuntur. Ac re quidem ipſa quævis, niſi mea me fallit Opinio, Objectorum Sonororum Impreſſiones Aeris, intra Cavitates Membranæ ſupra deſcriptæ contenti, aut ipſam extrinſecùs ambientis, quà ſcilicet Æthereâ gravidi materia interventu Momento citius interiora *Labyrinthi* per Portam & Feneſtram illius ſubeunt, & ex eodem *Labyrintho* Interjectu Spiritus Animalis, cui inibi communicantur, etiam Momento citiùs ad ovale uſque Cerebri Centrum tranſmittuntur; ibique loci pro diverſis Sonororum Objectorum Impreſſionibus diverſæ excitantur in Anima Ideæ, diverſas Soni Species deſignantes, quæ diverſis Nominibus exprimi ſolent. Eorum, quæ modo diximus, Veritas Experientia confirmatur; quoties enim pus Abſceſſus intra *Maſtoidem* Apophyſin, vel intra *Tympanum* ipſum producti hanc, de qua nunc, Membranam dilacerat, prorſuſque rodit, toties *Auditus* ita lædi-tur, ut multum imminuatur, ſi non prorſus aboleatur.

Ex ſupra dictis clare intelligitur, intra *Tympanum* neceſſariò excitandum eſſe tumultuoſum quendam Motum, præternaturalem Sonum producentem, quoties immodico Cibi, Potuſque uſu, vel Obſtructionibus imi Ventris, vel longis, plurimumque laborioſis Animi Contentionibus, vel aliâ quapiam

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Causâ nimia Sanguinis ſupra modum rarefacti, & Vaporoſi, quantitas ad Vaſcula ſuperiùs deſcriptæ Membranæ amandatur. Is enim Sanguis nimiâ Copiâ nimiaque Rarefactione ſua eas, quibus devehitur, Arteriolas magis quam par eſt dilatat necnon pulſat, & tum nimia hujuſmodi Vaſorum Dilatatione atque Pulſatione, tum nimio Halituum copioſorum, quos emittit, Motu hanc Membranam ita concutit, ut tumultuoſus aliquis Strepitus intra *Tympani* Cavum neceſſariò excitetur: præſertim ſi Vapores illi propter *Aquæductus* Obſtructionem, vel propter nimis compactam Texturam Exterioris Membranæ *Tympani* facilè tranſpirare nequeant. Tumultuoſi autem hujuſmodi Strepitus Impreſſio, ad ovale uſque Cerebri Centrum tranſlata, hanc in Anima excitat Ideam, quæ Murmuris Auris nomine vulgò exprimi ſolet. Hujuſce Murmuris tres ſunt Species omnibus notæ, & à nemine, quod ſciam, planè ac diſtinctè explicatæ; *Bombus* ſcilicet, *Sibilus*, & *Tinnitus*. Quoties Vapor ſupra modum copioſus, & exagitatus, qui *Murmur* aliquod in Auribus excitat, ita humidus eſt, ut ad Naturam Aquæ ſat propè accedat, Interiorem facilèque mobilem Membranam *Tympani* relaxat, & uno eodemque tempore ipſam movet varièque flectit: hinc fit, ut hæcce Membrana non nihil relaxata, motuque ſibi communicato variè ac velut undatim flexa cùm ambientem, tum intrâ Cavitates ſuas reconditum, Aërem ita exagitet, ut vibrationes debitas lentè necnon flexuosè, ac velut undatim ſeſe invicem excipientes patiatur, quales ferè patitur, dum vel ab Aqua e loco ſublimi delabente, &, cum primum delapſa eſt, undatim defluente, vel quamplurimis ab Apibus ſimul congregatis, & partim ſurſum, partim deorſum, partim obliquè, partimque in orbem motis agitatur. Iſtæ autem Vibrationes Spiritus Animalis Nervi Mollioris Auris textum interius occupantis Interjectu, ad Ovale uſque Cerebri Centrum delatæ, hanc excitant in Anima Ideam, quæ Sonum tumultuoſum gravem *Bombi* Nomine vulgò expteſſum deſignat. Ubi Vapor Murmuris cujuſdam in Auribus excitandi capax particularum Aquoſarum tam inops eſt, ut potius Exhalationis ſiccæ, quam meri Vaporis naturam redoleat, atque àdeo flatulentus ſit; is Membranam interiorem *Tympani*, dum huic allidítur, quadantenus exſiccat, illam expandit, atque diſtendit. Inde fit, ut hæcce Membrana communicato ſibi Motu nonnihil exſiccata, & expanſa, adeoque plurimùm diſtenta tum ambientem, tum intra Cavitates ſuas latentem Aërem ita concutiat, ut in eo Vibrationes validas excitet, quæ ſucceſſive ſanè, ſed tamen cito, & rectis vel fermè rectis Lineis ſeſe invicem conſequuntur. Ita ut ejuſmodi Vibrationes his ferè ſimiles ſint, quas patitur, quoties mero Flatu ſupra modum exagitatur; propterea illæ ad Ovale uſque Cerebri Centrum eâ, qua ſupra explicatum fuit, ratione tranſmiſſæ, hanc excitant in Anima Ideam quæ Sonum tumultuoſum ſat acutum *Sibili* nomine vulgò expreſſum deſignat. Quoties Interior Membrana *Tympani*, aut aliqua pars illius, ab Arteriolis ipſam irrigantibus ſolito frequentiùs, validiùſque Succuſſibus ſeſe velociſſime excipientibus ob Sanguinis fluxum tunc in his aliquatenus impeditum quatitur, toties illa (ſi tunc temporis præcalido & exſiccante quodam Halitu ita diſtendatur, ut immiſſos ſibi Succuſſus validè repercutiat) tum ambientem, tum intra Cavitates ſuas reconditum Aërem ita exagitat, ut eaſdem aut ferè eaſdem patiatur Vibrationes, quas pateretur, ſi Vibrationes illius Argen-

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teo Malleolo excitarentur, quo ſcilicet parvis Ictibus iteratis citiſſimè ſeſe excipientibus Incus parva percuteretur, quæ ex Argento, vel alio quodam Metallo valde ſonoro, proindeque ad incuſſos ſibi Ictus valide repercutiendos apto, conflata eſſet: Unde mirum non eſt, quod ejuſmodi Vibrationes, cum ad Ovale uſque Cerebri Centrum pervenere, hanc excitent in Anima Ideam, quæ ſonum præternaturalem *Tinnitus Auris* nomine vulgò expreſſum denotat.

Muſculos etiam Auris Internæ multis ab hinc Annis ſæpiſſime indagavi, & partem hanc duobus tantum inſtructam eſſe ſemper obſervavi. Hi Nervulos penè inſenſibiles à Nervis quintæ Conjugationis recipiunt, & Vaſculis Sanguiferis etiam penè inſenſibilibus irrigantur, quæ ſunt Arteriæ *Carotidis*, & Venæ *Jugularis* internæ Propagines. Illorum Primus craſſior & longior bina Capita, binoſque Tendines habet; unicum vero Ventrem, ideoque Muſculum *Monogaſtricum* nominare lubet. Primum Caput, Vaginulâ Membranaceâ veſtitum, è ſinu exiguo Oſſeo ſupra partem ſupernam *Aquæductus* excavato emergit; Secundum verò, quod mere carnoſum apparet, non procul à latere externo exigui ſinus Oſſei, de quo mox dictum, ſuam ducit Originem. Fibræ carneæ bina diverſa Capita Muſculi, de quo nunc agitur, componentes invicem ſtrictiſſimè uniuntur paulo antequam *Tympani* Cavitatem ſubeant, & tunc in Ventrem Vaginâ membranaceâ ſat valida undequaque cinctum unius & ejuſdem Muſculi deſinunt. Deinceps ipſæmet Fibræ carneæ, de quibus jam loquor, verſus *Tympani* Cavum ſeſe porrigentes, paulo poſtquam illud ſubierunt, ab invicem ſeparantur, & in binos Tendines Vaginulâ membranaceâ validâ indutos abeunt. Horum Primus, Secundo longior nec non gracilior, poſtquam ſeſe parum ſurſum erexit, parvæ Trochleæ membranoſæ interventu huic Oſſis Petroſi parti alligatur, cui inſculptum eſt Initium *Aquæductus Fallopii*, ſeu Canaliculi Oſſei, qui Nervum durum Auris admittit; ita ut Officioſo hujuſce membranoſæ Trochleæ miniſterio liberè motus omnes edat, quibus edendis dicatus eſt: Tendo iſte deorſum reclinatus ſuper gracilem *Malleoli* Apophyſin ad Perpendiculum deſcendit, eique annectitur ſeſe parum expandendo; unde fit ut ejus Nexus ad Cervicem uſque ipſiuſmet *Malleoli* extendatur. Secundus Muſculi, quem jam deſcribo, Tendo, Primo brevior & craſſior, multumque craſsâ Vaginâ membranacea veſtitus, in Cavitatem *Tympani* rectâ ferè porrigitur, & mediæ Capitis *Malleoli* parti annectitur, ibique ita explicatur, ut ejus nexus ad Corpus uſque *Incudis* protendatur, adeoque binis ejuſmodi Oſſibus invicem nectendis inſerviat: Tendo iſte Oſſi, cui ſuperſternitur membranaceæ Vaginæ ſuæ Interventu alligatur. Secundus Auris Internæ Muſculus emergit è Tubulo Oſſeo excavato in parte infima Oſſis, quod Portæ *Labyrinthi* & illius Feneſtræ Interjicitur. Muſculus iſte Muſculo *Monogaſtrico* ſupra deſcripto multo minor & brevior eſt: Hinc fit, ut illum Muſculum Minorem Auris internæ nominem. Ventrem carnoſum ſat craſſum habet, & Tendine ſuò maximè gracili Capiti *Stapedis* inſeritur.

Dum Muſculus *Monogaſtricus* Auris in ſemetipſum contrahitur, ſongior illius Tendo Caput *Malleoli* & Corpus *Incudis* parum ſurſum tollit. Parum ſolummodo dixi ſurſum tollere, quoniam Tendo brevior ejuſdem Muſculi, utpote Capiti *Malleoli* extremo ſuo fine annexus, quemadmodum longior illius

lius Apophyſi gracili, atque cervici annectitur, longiori renititur, dum ſeſe contrahit ; quia Vaginâ ſuâ oſſi alligatur, cui ſuperjacet, ut ſupra notatum, & propter ejuſmodi Nexum verſus ſuperiora multum tolli nequit ; unde fit, ut Tendinis longioris ſeſe contrahentis Niſui quodammodò reſiſtat, & impediat ne Caput *Malleoli* unà cum *Incude* verſus ſuperiora multùm tollat. Ubi *Malleoli* Caput ſurſum tollitur, Extremitas *Manubrii* ejus neceſſario deorſum inclinatur, adeoque partem mediam, cui adhæreſcit, exterioris Membranæ *Tympani* ex interioribus ejuſdem *Tympani* verſus exteriora pellit, atque adeo illam tendit, ejuſque Superficiem planam, aut ſaltem fere planam, reddit. Dum Tendo Muſculi *Monogaſtrici* Auris, de quo nunc, & *Malleolus* hæc, quæ modo dixi, munia præſtant, hanc extendunt Membranulam ſupra deſcriptam, quæ Membranam exteriorem *Tympani* ex tranſverſo ſecare videtur, cum non deſideratur. Ita ut ejuſmodi Membranula Muſculi *Antagoniſtæ* Muſculi *Monogaſtrici* Auris vices quodammodò ſupplere videatur; quoniam vi ſua Elaſtica naturalem Tenſionis ſuæ ſtatum recuperat, & eodem, quem tunc edit, niſu exteriori Membranæ *Tympani* ad ſtatum naturalem Tenſionis, & Figuræ ſuæ reſtituendæ conducit, cum hæc extremo fine Manubrii *Malleoli* premi ceſſat. Quemadmodum elatione Capitis *Malleoli* verſus ſuperiota extremitas Manubrii ejus parum deorſum inclinatur; ſic etiam elatione *Incudis* verſus ſuperiora extremitas internæ Apophyſeos illius paululum demittitur. Dixi modò elatione *Incudis* extremitatem internæ Apophyſeos illius paululum ſolummodò demitti ; quoniam *Incus* ita ſita eſt in fovea, Oſſi Marginem exteriorem Baſeos Cavitatis *Tympani* formanti inciſa, ut Corpus ejus ſurſum tolli nequeat, quin exterior illius Apophyſis extremitate ſua ei ò innitatur Oſſi ſibi ſubjecto, a quo hæc parum diſtat. Hinc fit, ut Muſculus *Monogaſtricus* Auris longiore Tendine ſuo *Incudem* verſus ſuperiora multùm erigere nequeat. Ex ſupradictis clarè patet ut plurimum binas, & aliquando tres eſſe Cauſas Mechanicas propter quas Muſculus *Monogaſtricus* longiore Tendine ſuo *Incudem* & Caput *Malleoli* paululum ſolummodò verſus ſuperiora tollit, adeoque internam Apophyſin ipſiuſmet *Incudis*, & Finem extremum Manubrii *Malleoli*, paululum tantummodò demittit.

Ubi Corpus *Incudis* parum ſurſum erigitur, interna illius Apophyſis parum deorſum inclinatur, ut mox notatum fuit, & uno eodemque tempore Caput *Stapedis*, cui Lenticularis Oſſis interjectu annectitur, ſecum trahit, adeòque parum quoque illud demittit. Dum caput *Stapedis* parum deorſum inclinatur, neceſſariò ſuperna pars Baſeos *Stapedis* ejuſdem à ſuperna Feneſtræ *Labyrinthi* parte, cui ſuperjacet, nonnihil recedit, atque adeo illam paululum aperit, & quodammodo pulſat, ſi ita loqui fas ſit. Ex his quæ modo dixi, facile intelligitur Tendinem longiorem *Monogaſtrici* Auris Muſculi Auditui facilìùs ac perfectiùs excitando bifariam conducere. Primùm enim quatenus Manubrii *Malleoli* extremitate Membranam exteriorem *Tympani* tendit, & Superficiem illius planam, aut ferme planam, reddit, ea ratione qua ſupra explicatum fuit, efficit ut Pororum ejus parietes nonnihil à ſe invicem diducantur, ac propterea Materia Ætherea, cum ad hanc Membranam appellit, incuſſis ſibi ab Objectis Sonoris impreſſionibus onuſta, illos ita patentes reperit, ut eos *Tympani* Cavum ingreſſura facilé permeet: Ubi vero *Tympani* Cavum ingreſſa eſt,

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levi ſuo Pondere, licet ſibi minimè incommodo (prædictis *ſcil.* impreſſionibus) in Ætheream ſeſe exonerat Materiam, quæ inibi concluſi Aeris Poros replet, quæque illas in *Labyrinthum* per Januam & Feneſtram illius transfert. Cum primum Objectorum Sonororum Impreſſiones ad interiora *Labyrinthi* pervenerunt; eæ ibi loci Spiritui Animali intra diverſas Nervi Mollioris Auris Propagines recondito, Æthereâque Materiâ gravido, incutiuntur; Spiritus verò Animalis merum ipſarum Characterem ad Ovale Cerebri Centrum tranſmittit, ubi hanc excitat in Anima Ideam, cui ex placito Dei Optimi Maximi excitandæ aptus natus eſt. Secundò, longior Muſculi *Monogaſtrici* Auris Tendo Auditui faciliùs ac perfectiùs producendo inſervit, videlicet quatenus eâ, qua ſupra explicatum fuit, ratione ſupernam Feneſtræ *Labyrinthi* partem paululum aperit; quoniam dum hæc aguntur, pars una Æthereæ Materiæ incuſſas ſibi ab Objectis Sonoris Impreſſiones ſecum vehens, ſecundum *Labyrinthi* veſtibulum faciliùs ingreditur, dum pars altera primum ſubit.

Dum Muſculus *Monogaſtricus* Auris contrahitur, is breviore ſuo Tendine Caput *Malleoli* una cum *Incude* verſus ſeipſum parum oblique trahit. Hinc fit, ut extremitas Manubrii *Malleoli*, & Acumen internæ Apophyſeos *Incudis* ex Interioribus *Tympani* verſus Exteriora neceſſariò inclinentur. Et verò dum finis extremus Manubrii *Malleoli* è Cavo *Tympani* verſus *Meatum Auditorium* inclinatur, hic neceſſariò convexam partem, cui annectitur, exterioris Membranæ *Tympani* deprimit, adeoque Naturali ejus Tenſioni augendæ, nec non utrique illius ſuperficiei planæ reddendæ plurimùm conducit. Ubi pars acuminata internæ Apophyſeos *Incudis* ex Interioribus *Tympani* verſus exteriora inclinatur, ut ſupra dictum fuit, hæc neceſſario Caput *Stapedis* Oſſis lenticularis Interventu ſibi annexum ſecum trahit, atque adeo partem lateralem internam Baſeos hujuſce Oſſiculi à parte quoque laterali interna Feneſtræ *Labyrinthi* nonnihil removet, & tunc Rimula interjicitur margini laterali ac interno Baſeos *Stapedis* ipſius, & margini quoque laterali ac interno Feneſtræ *Labyrinthi*, quæ Materiæ Æthereæ incuſſis ſibi ab Objectis Sonoris Impreſſionibus oneratæ, ac velut obſignatæ, & *Labyrinthum* ingreſſuræ aditum, ſed arctum ſanè, in Concham præbet. Ex his, quæ jamjam dixi, clarè patet Binos Muſculi *Monogaſtrici* Auris Tendines iiſdem Muniis obeundis dicatos eſſe; licet Motus eorum, utpote in diverſas loci partes prorogati, diverſimodè fiant, quin ſibi tamen adverſentur, ut ex ſupra dictis facilè intelligi poteſt. Ac re quidem ipſa eorum unusquiſque ratione ſibi propria exteriorem Membranam *Tympani* tendit, planamque reddere nititur; atque adeò Materiæ Æthereæ incuſſas ſibi ab Objectis Sonoris Impreſſiones ſecum vehenti aditum in Cavitatem *Tympani* expeditiorem reddit: dum longior ſupernam Feneſtræ *Labyrinthi* partem parum aperit, brevior ejuſdem Feneſtræ partem lateralem internam nonnihil recludit, quò Rimulâ tunc ibi loci factâ Æthereæ Materiæ aliqualis portio Concham ſubire queat.

Minor Muſculus Auris Internæ, ſi Originis & Inſertionis ejus ratio habeatur, in ſemetipſum contrahi non poteſt, quin *Stapedis* Caput, cui inſeritur, ab exterioribus *Tympani* verſus interiora trahat, atque adeò partem lateralem externam Feneſtræ *Labyrinthi* parum aperiat, ut Materiæ Æthereæ aditum in Concham præbeat. Ex his clariſſimè patet Muſculum Minorem Auris, de quo nunc, dum ſeſe contrahit & Muſculum *Monogaſtricum* ſpecta-

tum quâ Tendine ſuo breviori agentem Feneſtram *Labyrinthi* oppoſita prorſus ratione aperire. Hinc haud dubiè fit, ut propter oppoſitos Motus Naturales jamjam explicatos binorum ejuſmodi Muſculorum *Labyrinthi* Feneſtra nunquam multùm aperiatur, imò & aperiatur tantùm per latus ſuum externum Muſculo Minore agente. Contra verò hæc ipſamet Feneſtra per ſuperiora, & uno eodemque tempore per Latus ſuum internum recluditur, ubi Muſculus *Monogaſtricus* ſeſe contrahit, ut ſuperiùs fusè atque nitide explanatum fuit.

Partes ſuperius deſcriptas, quibus *Tympani* Cavum adornatur, muniis obeundis dicatas eſſe, quæ ab ipſis naturaliter præſtari dixi, à nemine in dubium revocari poteſt; quandoquidem Auditus toties læditur, quoties naturalis illarum ſtatus immutatur: Neque tamen quempiam in hanc abire Sententiam velim, illas ad Auditum excitandum abſolute neceſſarias eſſe; quia ſæpe in Sectione Cadaverum Humanorum obſervavi externam ut & internam *Tympani* Membranam, imò & aliquando majorem Muſculorum illius portionem deſiderari; quoniam hæ partes acri Pure Abſceſſus modò in Foveolis Apophyſeos *Maſtoidis* & modò in Cavo ipſiuſmet *Tympani* producti corruptæ, prorſuſque conſumptæ fuerant; & tamen in omnibus his Hominibus, quorum auris una vel altera, Abſceſſu Pus emittente laboraverat, *Auditio* in Aure affecta prorſus abolita non fuerat, ut ab illis, dum erant in Vivis, didici.

Adhuc mihi perpendendum ſupereſt, an bini Auris Internæ Muſculi voluntariè, vel abſque prævio ullo Voluntatis Actu, Motus illorum determinandi capace, moveantur. Re attentè, quantum fieri potuit, perpensâ, in hanc Sententiam non abire non potui, ejuſmodi Muſculorum Motum, utpote partim â Voluntate, partimve ab impreſſionibus Objectorum Sonororum, inſcia, imo & aliquando reluctante Anima, determinatum, partim quoque voluntarium & partim involuntarium eſſe. Ac re quidem ipſa veroſimillimum eſt, hoc ipſo Voluntatis Actu, quo ad aliquid facilè atque clarè audiendum determinamur, Spiritum Animalem determinari ad fluendum verſus Muſculos, de quibus mox dixi, ut Motum illorum promoveat, cujus ope rei Audiendæ Perceptio expeditius & clarius fiat. Verumenimverò Muſculorum Auris Internæ Motus, merè Voluntarius dici nequit; cum nemo ſit, qui propriâ Experintiâ perſuaſum non habeat illos præter Voluntatem ſæpe moveri, ut jam dixi. Quæ cum ita ſint, extrinſecam Cauſam, quæ Muſculos Auris Internæ ad ſeſe movendos determinat, nullam aliam excogitare licet quam Materiam Ætheream Objectorum Sonororum Impreſſionibus onuſtam. Et verò hujuſmodi Cauſam ea, qua ſequitur, ratione prædictos Muſculos ad Motus ſuos obeundos excitare veriſimillimum mihi videtur. Dum Materia Ætherea repetitis Vibrationibus ſuis, quæ ſeſe modò citiùs modò tardius excipiunt, ad exteriorem Membranam *Tympani* appellit, tota ferè in concavam illius partem derivatur, & tum ad eam appellendo, tum ejus Poros ſubeundo, & permeando illam percutit, & verſus Interiora Capitis protrudit. Ubi autem concava pars exterioris Membranæ *Tympani* percutitur, & verſus interiora Capitis protruditur, annexam ſibi extremitatem Manubrii *Malleoli* è *Meatu Auditorio* verſus *Tympani* Cavum pellit, ſurſumque erigit, & uno eodemque tempore Caput illius, eique alligatam *Incudem* deorſum inclinat. Dum Caput *Malleoli* & *Incus* deorſum inclinantur, binos Tendines Muſculi *Monogaſtrici*

gaſtrici Auris Internæ ad ſe trahunt, totumque Muſculum extendunt, atque adeo illum ita diſponunt, ut Vim Elaſticam ipſius Contractioni promovendæ aptam acquirat. Verum cum Vibrationes Aëris Ætherea Materia impræg-nati, utut cito fiant & ſeſe conſequantur, exiguis quibuſdam Temporis Intervallis, ſemper ab invicem diſtiguantur, certo certius eſſe mihi videtur & Temporis Intervallo, quod inter primam, Exempli gratia, & Secundam Vibrationem intercedit, prædictum Muſculum eâ, quam adeptus eſt, vi elaſtica, dum extenſus fuit, lenique ſua Extenſione determinare ad ſeſe contrahendum, & Spiritum Animalem avocandum, & reapſe contrahi, juvante ſcilicet Spiritu Animali recens Motricum Fibrarum illius Poros ingreſſo. Contractus autem Muſculus *Monogaſtricus Stapedem* ex Interioribus *Tympani* verſus Exteriora pellit, & ſic Muſculum Minorem Auris Internæ extendit, & ita diſponit, ut Vim Elaſticam ipſi contrahendo aptam adipiſcatur, cujus ope determinatur ad ſeſe contrahendum, & revera contrahitur Spiritu Animali interveniente, ſtatim atque Muſculus *Monogaſtricus* rurſus ea, quâ mox explicatum fuit, ratione iterum extenditur.

Partis alterius Internæ Auris, *Labyrinthi* ſcil. Exteriora & Interiora nunc luſtranda veniunt, ſi prius dixerim Os, ex quo Interiores ſingularum ejus Cavitatum Parietes conflati ſunt, album, duriſſimum, necnon maximè compactum eſſe. Id autem à Natura ita comparatum eſſe videtur, ut Materia Ætherea Sonororum Objectorum Impreſſionibus onuſta, dum prædictis impingitur Parietibus, nihil aut ſaltem fere nihil Motus ſui amittat, atque adeo illum qualem ab Objectis Sonoris accepit, talem aut ſaltem fere talem communicet Spiritui Animali contento intra Expanſiones Rami Mollioris Nervorum Auris, quæ variis atque variis modis configuratæ variè atque variè Interiora *Labyrinthi* adornant.

In Exterioribus *Labyrinthi*, quem Omnipotens intra Petroſum Os excavavit, & nunquam ſatis mirando modo effinxit, tria tantùm notatu digna ſeſe offerunt; Oſſeum nempe Sepimentum, ſupernam ejus partem occupans, quo intermedio Ductus tres ſemicirculares illius ab invicem diſpeſcuntur; & Aperturæ duæ non procul ab invicem diſſitæ, quæ Materiæ Æthereæ Aditum præbent è *Tympani* Cavo in *Labyrinthum*. Sepimentum hoc peculiare habet, quod Textum interius ejus quamplurimis Faveolis pervium ſit, intra quas permultæ Capillares Vaſorum Sanguiferorum Propagines deſſeminantur. Et verò Sanguis, quem ejuſmodi Vaſcula devehunt, miti Calore ſuo Naturalem fovet atque conſervat Motum Spiritus Animalis in Poris Membranularum Nervearum intra Semicirculares *Labyrinthi* Ductus reconditarum hoſpitantis, atque adeò impedit nè ſupra modum condenſetur, & Auditui excogitando ineptus evadat. Binæ Aperturæ in hac Oſſis Petroſi parte ſunt excavatæ quæ *Labyrinthi* Baſin conſtituit: Prima Figuram habet Ovalem, & ſitus ejus paulò altior eſt quam ſitus Secundæ: hæc *Labyrinthi* Feneſtra nuncupanda mihi videtur; ſiquidem Conchæ ac proinde *Labyrinthi* Interioribus inhiat. Hanc Aperturam interioribus *Labyrinthi* inhiare non abs re dixi, cum hæc Parieti Conchæ inciſa ſit, quæ pars illius eſt, cujus Interventu reliquas inter partes ejus interiores Communicatio quædam habetur, ut infra dicetur. Huicce Feneſtræ *Stapedis* Baſis applicatur, & illam claudit, quam diu Auris Internæ Muſculi otiantur; contrà verò eam paululum recludit, quoties eo-

rundem Muſculorum alteruter in ſemetipſum contrahitur, ut ſupra explicatum fuit. Alteram binarum Aperturarum ferè rotundam *Labyrinthi* Januam appello; quoniam hæc Aditum præbet in parvam Cavitatem fermè rotundam, qua itur ad *Labyrinthum*. Etenim parva hæcce Cavitas cum Cochleæ extremitate Ductus ſemiovalis ſpiralis illius, & cum Concha Rimulâ Baſi ejus incisâ, atque adeo cum Ductibus ſemi-circularibus in ſequentibus deſcribendis communicat, ut poſtmodum explicabitur. Quæ cum ita ſint prædictam Aperturam Januæ *Labyrinthi* nomine jure, meritoque à me inſignitam eſſe nemo non videt. Janua iſta Membranulâ tenuiſſimâ velatur, & obturatur, quæ utpotè rariſſimam habens Texturam Æthereæ Materiæ Objectorum Sonororum Impreſſiones ſecum vehenti facilem in *Labyrinthum* Aditum præbet.

Cavitatem iſtam exiguam retro Januam *Labyrinthi*, Primum illius Veſtibulum nominari poſſe mihi videtur; cum hâc eatur ad cochleam, & Concham à Clariſſ. D. *Du Verney* Veſtibulum *Labyrinthi* nominatam. Ita ut tres ſemicirculares *Labyrinthi* Ductus, & Cochlea ſint veluti bini ejus Androues ab invicem Conchâ diſtincti, & tamen ejus Interjectu ſimul communicantes; proptereaque illam Secundum *Labyrinthi* Veſtibulum nuncupo. Tenuiſſima hæc Membrana, quam *Labyrinthi* Januam obturare ſuperius dixi, in Primum illius Veſtibulum exporrigitur, totamque ſuperficiem ejus interiorem cooperit, proindeque extrinſecus claudit Rimulam Baſi Conchæ inciſam, & Cochleæ Finem extremum; ita ut hæc adhæreſcat tenuiſſimis Membranis Nerveis Conchæ, & Cochleæ interiora occupantibus, earumque Interventu cum Ramo Molliori Nervorum auris communicet. Veſtibulum Secundum, quod idem ac Concha Veterum Omnium Anatomicorum ſonat, multo magis amplum eſt quàm Primum: Cavitas ejus pene rotunda duarum circiter linearum Diametrum habet; ita ut duo fere Tritici grana in tres vel quatuor portiunculas diviſa in Adultis continere poſſit, ut aliquoties expertus fui: in ea novem obſervantur Aperturæ; bina nempe Foramina exigua, peneque inſenſibilia, quæ in ipſam aditum præbent binis propaginibus exiguis Rami Mollioris Nervorum Auris inferius deſcribendis; Rimula ſat longa non nihil flexuata Baſi ejus inciſa; Ovalis Apertura in Pariete illiùs *Tympani* Cavum reſpiciente ſculpta, & ab Antiquis Anatomicis Feneſtra Ovalis nuncupata; & Oſtiola trium Ductuum ſemicircularium, quæ quinque tantùm ſunt; quoniam Ductus ſemicircularis ſuperior, qua ſcilicet parte Capitis poſteriora reſpicit, inferiori cum Ductu ſemicirculari ita coit, ut ambo ſibi communi Oſtiolo unico Conchæ interioribus inhient. Hinc fit, ut Oſtiolum iſtud unà cum recentioribus Anatomicis Portam Communem nucupem. Singula Ductuum trium ſemicircularium Oſtiola ita configurata ſunt, ut Oſtium finem extremum Tubæ occupans quadantenus referant. Ac re quidem ipſa ſemicircularium ejuſmodi Ductuum Cavitatem, ſi attentè quantùm par eſt exploretur, à media ſui parte ſenſim ampliorem fieri ad binas uſque ſuas extremitates Oculis clarè patet, ac proinde illam ea fermè ratione utrinque finiri oportet, quâ Tubæ cavitas finitur: hæc de quibus nunc ſermo habetur Oſtiola ita diſpoſita ſunt, ut duo ſummam, & duo imam Con-

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chæ partem occupent; quintum verò ſat prope Rimulam ipſiuſmet Conchæ Baſi inciſam ſitum eſt.

In hoc Secundi Veſtibuli *Labyrinthi* latere, quod exteriora Capitis reſpicit, exigui tres ſunt Canales rotundi, quos, utpotè in ſemicirculum inflexos, una cum Recentioribus Anatomicis Semicirculares appello. Et verò ut Canales iſti ab invicem diſtingui poſſint, illis diſtincta Nomina ab eorum ſitu deſumpta tribuam: Primum Superiorem nuncupabo, quod arcuatum Conchæ Laquear circumdet; Secundum Inferiorem quòd imas ejuſdem Laquearis Conchæ partes cingat; Tertium verò, quippe qui inter Primum & Secundum ſitus eſt, Medium nominabo. Semicircularis Ductus Superior, cum primùm è Veſtibulo prodiit, ſurſum tendit, ſurſumque tendendo paululum in ſemetipſum inflectitur; ubi vero paulo pluſquam dimidum Circulum deſcripſit, & ad medium uſque Poſticæ Oſſis petroſi partis ſeſe parum incurvando exporrectus fuit, inferiori committitur Canali, ut mox dicetur. Semicircularis Ductus Inferior, ex ima Conchæ parte prodit, &, decurſo paulo majori quam dimidii Circuli ſpatio, Ductui ſemicirculari Superiori adjungitur, ut modo dixi; itaque bini Ductus iſti in unum planè coaleſcunt, qui oblique protenditur, donec in Portam Communen deſinit. Semicircularis Ductus Medius ſeparata duo habet Oſtiola, nec pluſquam ſemicirculum deſcribit. Ductus iſti, quorum ſuperficies interior valdè lævigata eſt, ut plurimum interius rotundi ſunt, & aliquando Figuram Ovalem imitantur.

In hoc Secundi Veſtibuli *Labyrinthi* latere, quod tribus Ductibus ſemicircularibus oppoſitum eſt, & Capitis interiora reſpicit, alterum *Labyrinthi* Andronem Cochleam dictum, collocavit Natura. Cochleam in binas divido partes, quarum prima Cochleæ nomen retinet, & Cavitatem habet, quæ lentem craſſiorem facile admittere poſſet: altera vero pars Ductus ſemiovalis Spiralis dicitur. Hâc Rami Mollioris Nervorum Auris portione, quæ per Cochleam diſſeminatur, exemptâ, oſſeum Mediæ illis Baſi adnatum Corpus obſervatur Lineâ circiter unâ longum, in ſpiram diſpoſitum, & quadantenus Pyramidale, ac proinde Nucleus Pyramidalis Cochleæ nuncupatum Hicce. Cochleæ Nucleus circa mediam ſui partem lateralem Capitis Interiora reſpicientem tenui laminâ oſſeâ pellucida innititur, quæ marginem Oſtii Ductus ſemi-ovalis ſpiralis partim conſtituit, imo & latus internum Secundi Gyri Laminæ Spiralis prædicto Nucleo Pyramidali circumductæ partim format; ita ut Secundus ille Gyrus Laminæ Spiralis de qua jam dixi, partim Oſſeus, partimve Nerveus ſit. Intra Medium Nuclei Pyramidalis Textum unum excavatum eſt Foramen valde ſenſibile. Non procul ab Acumine Nuclei Pyramidalis jamjam deſcripti tenuiſſima in Adultis obſervatur Prominentia Oſſea in Orbem diſpoſita, & quarta circiter Lineæ unius parte lata, quæ Superficiei internæ Cavitatis Cochleæ adnata eſt, proindeque illam Apophyſin Orbicularem Cochleæ appello. In Medio Oſſe Cochleæ extremitatem formante una excavata eſt Foveola. Cæterùm tota ſuperficies interior Cochleæ valde lævigata eſt, & ſi Microſcopii interpoſitu inſpiciatur, quamplurimis Foraminibus exiguiſſimis pervia apparet, potiſſimum in ea parte, quæ Nuclei Pyramidalis Baſi circumjacet. Secunda Cochleæ pars eſt Ductus ſemi-ovalis Spiralis, ut ſupra notatum, qui à Baſi Cochleæ,

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ubi ſuum habet initium, ad ſupernam Primi Veſtibuli *Labyrinthi* partem, & Rimulam uſque Baſi Secundi inciſam protenditur: Cavitas ejus ita conformatur, ut in ſemi-ovalem ſpiram diſponatur, & circa finem paulo latior ſit, quam circa initium: hac Rami Mollioris Nervorum Auris portione ſemota quæ per eam diſſeminatur, in illa Proceſſus Oſſeus tenuiſſimus obſervatur, qui à latere interno Baſeos Nuclei Pyramidalis Cochleæ ad extremitatem uſque illius porrigitur. Hunc proceſſum Oſſeum, utpote minimum, Lineam Oſſeam Ductus Semi-ovalis ſpiralis Cochleæ nominare lubet. De cætero, tota Superficies interior ejuſmodi Ductus exiguiſſimis pluribus Foraminibus pervia valde lævigata eſt, ſi hanc partem illius exceperitis, in qua Linea Oſſea, de qua ſupra, prominet.

Ramus Mollior Nervorum Septimæ Conjugationis Ramo Duriore craſſior, licet multò pauciores quam ille Fibras Medullares à Proceſſu Annulari recipiat, Internum Auris Ductum ingreſſus in tres dividitur Ramulos; Superiorem nempe, Infimum, & Medium. Superior Conchæ Cavitatem ſubit per Foramen peculiare ſupernæ illius parti inciſum; ibique in Membranam tenuiſſimam rariſſimam nec non molliſſimam explicatur, quæ totam ejus Superficiem cooperit, ſi Fibrillam illius excipiatis retinentem Formam Nervuli qui innititur & adhæret exiguæ Apophyſi Oſſeæ nonnihil acuminatæ marginem internum ſupra notati Foraminis occupanti, & ob ſuperficiem ſuam parum inæqualem, Nerveâque Membranâ albicante jamjam deſcriptâ coopertam exiguum Apicem album quadantenus æmulanti. Nervulus ille Molliſſimus tenerrimuſque Arteriolam & Venulam Comites habens, quæ latera illius occupant & immediate tangunt, ubi ſecedit ex Apophyſi Oſſea, cui eum innixum & adhærentem eſſe modò dixi, Mediam Conchæ Cavitatem inſtar Funiculi tenſi decurrit, & ad latus uſque Portæ Ductui ſemicirculari Superiori, & Ductui Semicirculari Inferiori communis porrigitur, eique adhæreſcit, ac deinceps Portam Communem ſubit, eamque ſubeundo in binas expanditur Membranulas, quarum una ſuperficiei Interiori Cavitatis Ductus ſemicircularis Superioris, & altera interiori quoque ſuperficiei Cavitatis Ductus Semicircularis Inferioris, ſuperſternitur. Infimus ac Minimus Rami Mollioris Nervorum Septimi Paris Ramulus unâ aut alterâ pene inſenſibili Fibrilla emiſsâ, quæ diſſeminatur intra Textum interius hujus Oſſis Petroſi partis intra quam Semicirculares *Labyrinthi* Ductus excavati ſunt, per exiguum Foramen ſubit, cujus interventu in infimam Conchæ partem ſeſe inſinuat, & inibi explicatum tenui huic Membranæ formandæ impenditur, quam interiori Conchæ ipſius ſuperficiei ſuperſtratam eſſe ſupra dixi, ſi portiunculam illius exceperitis, quæ Ductum ſemicircularem Medium ingreditur per Foramen ſitum paulo ſubtus Portam Communem, de qua ſuperius, ibique in Membranulam tenuiſſimam expanditur, quæ Interiori Ductus illius ſuperficiei ſuperſternitur. Nerveæ Membranulæ tenuiſſimæ Interiora Ductuum ſemicircularium *Labyrinthi* occupantes irrigantur Vaſis ſanguiferis exiguiſſimis, & ut plurimum Oculorum Aciem fugientibus, dum ſcilicet nullum, vel pauciſſimum tantum ſanguinem intra perexiguas Cavitates ſuas continent. Ipſæmet Membranulæ, utpote limpidiſſimo ac ſubtiliſſimo liquore ſpirituoſo imbutæ, præſertim in recèns natis, adeò Molles ſunt, ut

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vix tangi possint, quin dilacerentur, utut leviter Instrumento quovis tangantur. Præterea illæ, si Radiis Solaribus excalefacto Aeri exponantur, citissimè exsiccantur, & ita friabiles evadunt, ut, si è sede sua dimoveantur, in frustula minima dividantur, terantur, & redigantur in Pulverem subtilissimum qui facilimè tenues evanescit in Auras. Limpidissimus pariter Liquor spirituosus, quo Membranulas, de quibus nunc, semper imbutas esse dixi, & qui nihil aliud esse videtur quàm spiritus Animalis ob nativam loci quem occupat Frigiditatem nonnihil condensatus, feré momento citiùs dissipatur, postquam ductus semicirculares *Labyrinthi* aperti fuerunt, quos in recens natis ejusmodi Liquore semper repletos Observavi. Hoc autem aliter sese haberet necessarió, si quinque Ostiola, quibus Semicirculares *Labyrinthi* Ductus interioribus Conchæ inhiant, Membrana Nerveâ superius descriptâ naturaliter obturata non essent. Nequaquam tamen dubitandum mihi videtur, quin Liquor, de quo modò locutus sum, Membranæ Nerveæ Conchæ poros sensim sine sensu subeat, & impediat ne supra modum exsiccetur, hinc fit, ut nativam illius Temperiem conservet; qua scilicet Auditui excitando conducit. Ex supra dictis patet incisam Conchæ Basi Rimulam, & Ovalem illius Fenestram, ut & quinque Ostiola Ductuum trium semicircularium *Labyrinthi* Nerveâ, tenuissimâque Membranâ obturari, quæ Conchæ Interiora occupat, ut supra dixi.

Medius Rami Mollioris Nervorum Septimi Paris Ramulus juxta hanc Ossis Petrosi partem, quæ Basis est Nuclei Pyramidalis Cochleæ, plures emittit Fibrillas, quæ cum primum Cochleam ingressæ sunt Arteriolis & Venulis comitatæ suam inibi formam mutant, & sequenti ratione disponuntur, atque distribuuntur: Imprimis tenuis illarum Membrana, quam Piæ Meningi acceptam referunt, ita explicatur ut desinat in Membranulam tenuissimam, & numerosissimis Vasculis sanguiferis irrigatam, quæ primò cooperit superficiem Baseos Nuclei Pyramidalis Cochleæ, & quicquid ab illa usque ad Secundum gyrum laminæ Spiralis ipsiusmet Nuclei Pyramidalis continetur, ac deinceps in ductum Semi-ovalem Spiralem ejusdem Cochleæ porrigitur, & ita expanditur, ut finem illius extremum obturet, & totam ejus superficiem, imò & utrumque latus Laminæ spiralis semi-ovalis inibi reconditæ obducat. Et verò hæcce Membrana, cum tenuissimæ rarissimæque Texturæ sit, non impedit quo minus Materia Ætherea continuò & expedite è *Tympano* in *Labyrinthum*, singulosque illius recessus transeat, licet Ductus Semi-ovalis Spiralis Cochleæ finem extremum obturet, ut supra notatum. Hinc fit ut sita retrò *Labyrinthi* Januam Cavitate ad *Labyrinthum* ipsum iri supra dixerim. Quod attinet ad Substantiam Medullarem Fibrillarum Nervearum, de quibus nunc sermo habetur, hujus portio una impenditur formando Secundo Gyro Laminæ spiralis Nucleo Pyramidali Cochleæ circumductæ, cujus scilicet Gyri latus internum merè Osseum est, ut superius insinuavi; altera vero portio Initium ejusdem Laminæ Spiralis primùm format, quod in dimidio tantùm Gyro merè Nerveo consistit, ac deinceps in ductum Semi-ovalem Spiralem Cochleæ porrecta desinit in Laminam Spiralem Semi-ovalem verè Nerveam, quæ inibi reconditur, quæque crassiore sui parte Lineæ Osseæ hujusce Ductus adhæresci. Ita ut initium Laminæ Spiralis Nuclei Pyramidalis

Cochleæ

Cochleæ ſit etiam initium Laminæ Spiralis Semi-ovalis, quàm modò deſcripſi. Ejuſmodi autem Lamina Spiralis Semi-ovalis ad extremum uſque finem Ductus, intra quem latitat, exporrecta nonnihil acuminata extremitate ſua mediæ parti Rimulæ Baſi Conchæ inciſæ adhæreſcit, adeoque ejuſmodi Ductum in partes binas diſpeſcit, inter quas nulla eſt ſenſibilis communicatio: Binæ iſtæ partes Ductus Semi-ovalis Spiralis Cochleæ ita diſpoſitæ ſunt, ut prima, quæ Capitis Interiora reſpicit, cum Primo & Secundo Veſtibulo *Labyrinthi* communicationem habeat; ſecunda verò *Tympanum*, proindeque Capitis Exteriora reſpiciens, cum Concha tantùm communicet. Medius Rami Mollioris Nervorum Septimi Paris Ramulus, Fibrillis tenuiſſimis modò deſcriptis emiſſis, foramen exiguum intra medium textum Nuclei Pyramidalis Cochleæ inciſum ſubit, Arteriolam Venulamque Comites habens, & cum primùm ex illo egreſſus eſt, tenuiſſima ejus Membrana ita explicatur, ut cooperiat quicquid à ſecundo Gyro Laminæ Spiralis Nuclei Pyramidalis Cochleæ partim Oſſeo & partim Nerveo, ut ſupra dictum, uſque ad extremitatem ejuſdem Cochleæ continetur; Medullaris verò illius Subſtantia deſinit in tertium Gyrum totum Nerveum Laminæ Spiralis, de qua mox dixi, qui circumferentiâ ſua innititur, & adhæret Apophyſi Orbiculari Cochleæ; demumque pars illius extrema in Membranulam expanditur, quæ undequaque paululum in ſemetipſam inflexa margini Foveolæ in media extremitate Cochleæ excavatæ applicatur, & adhæreſcit, atque adeo parvam format cavitatem exiguum Poculum clauſum imitantem, cui innatus tantùm Aer ineſt.

Ex jam dictis patet Laminam Spiralem intra Cochleam reconditam dimidio uno Gyro, & Gyris duobus integris ſolummodo conſtare, qui exiguis cavitatibus innato Aere repletis, inter quas nulla eſt ſenſibilis communicatio, ab invicem diſtinguuntur. Hic notandum venit quod Lamina Spiralis Nucleo Pyramidali Cochleæ circumducta, & Lamina Spiralis Semi-ovalis intra Ductum Semi-ovalem Spiralem ejuſdem Cochleæ recondita, ut & Membranulæ Nerveæ interiori ſuperficiei Ductuum trium Semicircularium ſuperſtratæ Succo limpidiſſimo Spirituoſo, præſertim in recèns natis, imbutæ ſunt, qui apertâ Cochleâ viſu deprehenditur, & citiſſimè diſſipatur. Interior verò, ſeu Medullaris ac verè Nervea Subſtantia prædictarum Laminarum brevi exſiccatur, & valdè friabilis evadit, ſi calido Aeri aliquandiu exponatur, ut ſupra notatum.

Ex iis, quæ modò dixi de Ramo Molliore Nervorum Septimæ Conjugationis, facile intelligi poſſe mihi videtur binas ſuperius deſcriptas Laminas Spirales Nerveas unà cum tenuiſſimis Nerveis Conchæ, & Ductuum trium Semicircularium interiora occupantibus immediatum atque completum Auditus Organum conſtituere; adeo ut pro diverſis Motibus, qui in eo, quem proprios intra Poros recondunt, Spiritu Animali ab Objectis prædicti Senſus excitantur, & communi Senſorio communicantur, diverſæ in Anima Soni Ideæ producantur.

The Structure of the Noſe; by M. du Vernay. n. 139. p. 976.

XIX. M. *Du Vernay* hath obſerv'd, that the Cavities of the Noſe are fill'd with many Cartilaginous Lamines diſtinct one from another: every Lamine being divided into many others, all folded almoſt into a Spiral Line. And

that

that the *Os Cribroſum* is made up of the Extremities of theſe Lamines, which butt upon the Root of the Noſe, the Holes wherewith it is pierced being the Intervals between the Lamines. They are deſigned to uphold the inner Tunick of the Noſe; Which Tunick, being a principal Organ of Smelling, hath received from Nature a very great Expanſion, being folded round about together with theſe Lamines, that by this induſtrious Mechaniſm ſhe may employ all its length in a very little Room. This Tunick is fill'd with an innumerable Company of ſmall Rays, ſo many Branches of Arteries and Veins, and eſpecially Nerves, by which it hath a moſt exquiſite Senſe: by its great Expanſion, a greater Number of the ſubtile Particles of Odorant Bodies ſtrike it at the ſame Time, and ſo render their Impreſſion more ſtrong; and by the Labyrinth, made by the Windings of the *Lamellæ*, they are arreſted and make a longer ſtay before they paſs off from thence into the Breaſt. For the ſame Reaſon Nature has furniſht the ſaid Tunick of the Noſe with a great many ſmall Glands, which open thereinto; and ſo moiſtenit with a thick and ſlimy Exudation, the better to intangle the Dry Odorant Particles.

This Tunick being compared in ſeveral Animals ſhews much of the Reaſon of the Delicacy of ſmelling in ſome, above what it is in others. For look how much a finer Noſe it is that Animals have, they have likewiſe ſo much a greater Number of theſe *Lamellæ*, wherewith the ſame Tunick is roll'd up in ſo many more folds. So the Noſe of a Hound is better furniſhed with them than that of any other Animals. The Hare, Fox, Cat, Wild Boar, have a Conſiderable number of them. Thoſe Animals that chew the Cud have fewer. And Man is leſs ptovided for than any of the Reſt.

2. Not only the Number, but the Length alſo of the *Lamellæ*, is of great uſe for the ſtrength of Smelling: For which purpoſe moſt Quadrupeds, which either Hunt, as the *Carnivorous*, or diſtinquiſh their food by the Smell, as the *Graminivorous*, have their Noſe not placed in the middle of the Face, as in Man; but prolonged to the very end. *By ..... Ib.* p. 977.

XX. 1. In *June* 1684. I was call'd to a Patient who had a *Polypus* in the right Noſtril. I drew it out without Pain, or any bad Accident: But after this extraction, ſhe ſtill felt ſome trouble in her Noſe, and Moiſture did paſs with Difficulty from the Noſe to the Throat. This engaged me, ſeeing no more in the Noſtrils, to look into the Mouth, where I perceived behind the *Uvula*, a ſtrange Body of the Bigneſs of half a Nut, which I judged to be a portion of the ſame *Polypus*: and being encouraged by the advice of M. *Fede* and M. *Vary*, I pull'd it out in their preſence. We found it of an extraordinary ſhape; the piece by which I laid hold of it was hard, and of a dark brown; it was faſten'd by two Branches, which ſeem'd to have taken their ſhape in the Noſe, being each of them as big as a ſweet Almond, but their ſubſtance was ſofter and whiter; it had alſo little Stalk, ſomething Red, of the bigneſs of a Cherry Stalk. There was *The Original of a Polypus*; by M. Giles. n. 226. p. 472.

not a drop of Blood ſpilt, and the Patient felt no Pain in the Operation; all Trouble was removed, and the Liquor paſſed eaſily.

At the end of two Years the Patient died of a Malignant Fever; and for as much as ſome time before her Death, ſhe complained of a new Trouble in her Noſe, we obtained leave to open this Organ. After we had broken the Bone, we found nothing in all the Noſe but a little piece of Fleſh very ſoft, which came out of a Cleft of the *Proceſſus Pterygoides*; we followed it exactly, which brought us into the Sinus of the Upper Jaw; we broke this Bone alſo, and perceived in this Sinus a Ropy and clear Humour, in the middle of which there was a Body like in Figure, Conſiſtence, and Colour, to a greater one, which we had before taken out; we took notice alſo of a little Red Speck, which ſeem'd to be the Root of this *Polypus*.

By ..... ib. p. 473.

2. The *Polypus*'s are ſpungy Excreſcencies, which, according to Authors, are form'd upon the Membrane that covers the Noſe within, by ſome Alteration made there: ſome are form'd alſo in other parts, as in the Cavities of the great Veins. But this Membrane is more diſpoſed to the Production of them than others, becauſe it is the moſt Spungy of the whole Body, and moſt full of Blood Veſſels. When theſe Excreſcencies appear very Red and full of Blood, the Extirpation of them is dangerous, for fear of an *Hemorhagie*, which is not eaſily ſtopt: Therefore ſome do uſe Cauſticks of ſeveral ſorts with good ſucceſs.

The Organ of Taſte; by S. Malpighi. n 27. p. 492

XXI. 1. *S. Malpighi* hath diſcover'd in the Tongue many little Eminencies, which he calls *Papillary*, and believes to be the Principal Organ of *Taſte*.

By S. Fracaſſati. ib.

2. *S. Fracaſſati* obſerves, that as the Tongue hath toward its Point many Eminencies, by the Means whereof it goes, as it were, to meet Objects of Taſte; ſo on the contrary, it hath many Cavities towards its Root, wherein it receives them. All which Cavities terminate in Nerves, and ſeem to ſerve for Funnels to convey the Aliment into them. Which maketh the Author think it very probable, that the fineſt part of the Aliment paſſeth immediately from the Tongue into the Nerves, whence it comes to paſs, that Wine, being only taken into the Mouth, reſtoreth Vigour preſently.

A New Salival Duct diſcovered; by Caſp. Bartholine. n. 164. p. 749.

XXII. Glandulæ omnes, quæ Oris cavitati Salivam ſubminiſtrant, & ejuſdem generis Vaſa Excretoria in Os emittunt, numero Vaſorum diſtincta accuratiſſime proponuntur à *Stenonio* in obſervationibus Anatomicis de Glandulis Oris. Quædam enim unico duntaxat Excretorio Vaſe præditæ ſunt, quædam pluribus. Illa Vaſa, quæ numero plura, ſed exigua in Oris cavitatem confluunt, propria ſunt iis Glandulis, quæ variè ſparſæ reperiuntur in Buccis, ſub Lingua, in Palato, & Tonſillis. Vaſa vero majora, quæ à Glandulis Conglomeratis unico prodeunt Canali, hactenus ſaltem duo utrinque innotuerunt, quorum primum Superius eſt à Parotide Conglomerata ortum & à *Stenonio* inventum atque deſcriptum: Secundum vero Inferius, cujus primam

mam delineationem *Warthoni* Diligentiæ debemus, quod à Glandula Maxillari inferiori provenit. Sed duobus illis hactenus descriptis Vasis tertium, ejusdem planè generis, addi debet, Mihi Primo Observatum *A.* 1682. 13. *Martii*, quodque Inferius etiam dici meretur, quippe à sublinguali Glandula ortum, *Warthoni* Ductum comitatur, & sub Lingua eodem quo *Warthonianus* loco aperitur, Ostio æque manifesto. Etenim cum in Capite Vitulino extremitate Styli inquirerem & prosequerer Ductum á Glandula Maxillari Inferiori progredientem à *Warthono* descriptum, forte in alium Ductum addactus Stylus aperuit ea quæ mihi antè ignota erant. Credideram enim eundem Ductum me ad *Warthonianam* Glandulam perducturum, & ecce eo loco, circa mediam scilicet Linguæ longitudinem, ubi *Warthonus* Ductum suum Salivalem à Linguæ lateribus, nimirum in inferiore ejus parte, Cute & Pinguedine Glandulosa regi dicit, ferebatur hic Ductus ad aliam Glandulam è Conglomeratarum genere, quæ proximè accumbit iis Glandulis, à quibus oriuntur Ductus illi Salivales qui Sublingualium nomine describuntur à *Stenonio*. Etenim illa Glandula (quæ in nonnullis Animalibus Glandulæ Maxillari Inferiori propius adjacet, & majuscula est; in aliis vero minor & magis versus extremitatem Maxillæ Inferioris sita) uti ejusdem plane Structuræ est, ac Maxillaris illa *Warthoniana* Inferior, ita etiam simile plane Vas Excretorium habet satis conspicuum, cujus Ductus Laterales ab omnibus Glandulæ Glomeraminibus orti, in medio communem & satis capacem Truncum habent, qui Ductu recto comitatur illum alterum à *Warthono* descriptum & intra Gingivas in Maxillæ Inferioris extremitate, inter Papillas quasdam compressas & rigidas, Maxillæ pertinaciter adhærentes, in Os aperitur.

Talis primo mihi tunc temporis obtulit se Ductus ille cum sua Glandula in Vitulini Capitis examine: confirmata deinde sæpius est hæc Observatio in aliis Animalibus. In Ove, in ipsis illis Papillis, sub Lingua in inferiori Maxilla conspicuis, terminatur extremitas hujus Ductus, juxta quam etiam simili modo in eadem Papilla hiat Ostium Ductus *Warthoniani*. In Urso, utrinque prope Linguæ Frænulum suâ cujuslibet Ductus Ostium Papillâ eminet. In Leæna, quam nuper Indulgentia Augustissimi Regis nostri Theatro Anatomico concessam habuimus, itidem ad Linguæ Frænulum exeunt quidem utriusque Ductus Ostia, sed ita ut sibi quasi peculiare quoddam Frænulum habeant à Tunica Oris interiori efformatum. Ipsa autem Glandula cui Originem debet Ductus noster, in Principe hoc Animalium, major est & oblongiuscula, atque altera sui parte pertingens usque ad Glandulam *Warthonianam*, atque uti variis constat Glandularum Glomeraminibus, ita ex iis provenientes variæ Ramificationes emittuntur ad communem Ductum, qui ex minoribus aliis extra Glandulam coalescit, & recto tramite *Wartohnianum* ad exitum comitatur. Similem etiam distributionem & exitum eorundem Vasorum, atque eodem fere modo sitas & confirmatas Glandulas nuper deprehendimus in Lynce. Et ut singula fiant illustriora addimus duas Figuras, Ex Anatome Leænæ desumptas, progressum atque Exitum Ductus hujus indicantes.

Explication of the Figures.

Prior Figura, Exprimit Glandulam Maxillarem Inferiorem A, cum Ductu Salivali *Warthoniano* B B, simulque vicinam Glandulam Sublingualem C, Fig. 6.

cum Ductu ſuo Salivali D, jam primum à nobis deſcripto, cujus variæ Ramificationes per totam Glandulam diſperſæ conſpiciuntur.

Fig. 7. *Figura Altera*, indicat duo utrinque Oſtia Ductuum Salivalium Inferiorum, *Warthoniani* nempe & *Noſtri*, quorum locum ſub Lingua deſignant extremitates Stylorum *a a a a*, per dicta Oſtia exeuntium ſub Lingua *b*, quæ hic pauliſper revulſa cernitur à Maxilla inferiori *c*, ut ſingula rectius pateant.

XXIII. *Accounts of Books and Additions omitted.*

n. 22. p. 397. 1. ANatome Medullæ Spinalis, & Nervorum inde provenientium; *Gerardi Blaſii*. M. D.

n. 29. p. 553. 2. Tetras Anatomicarum Epiſtolarum, *Marcelli Malpighii* & *Caroli Fracaſſati*, de Lingua & Cerebro; *Bononiæ*.

n. 64. p. 2081. 3. *Franc. Joſ. Burrhi* Epiſtolæ duæ ad *Thomam Bartholinum*. Hafniæ. 1669. in 4°.

n. 174. p. 1144. 4. *Raymundi Vieuſſens*, M. D. *Monſpelienſis*, Neurographia Univerſalis. *Lugd.* 1685. in *Fol.*

n. 215. p. 32. 5. The Anatomy of the Brain, containing its Mechaniſm and Phyſiology, together with ſome new Diſcoveries and Corrections of Ancient and Modern Authors upon that Subject: To which is annex'd, a particular Account of Animal Functions and Muſcular Motion; by *Hen. Ridly*. M. D.

n. 31. p. 600. 6. Pathologiæ Cerebri & Nervoſi Generis Specimen: In quo agitur de Morbis Convulſivis & Scorbuto; Studio *Thomæ Willis*. M. D.

n. 67. p. 2059. 7. *Antonii Molinetti* Diſſertationes Anatomicæ & Pathologicæ de Senſibus & eorum Organis; *Patavii*. 1669. in 4°.

n. 129. p. 746. n. 175. p. 1186. 8. Opthalmographia, ſive Oculi ejuſque partium Deſcriptio Anatomica: Cui acceſſit Nova Viſionis Theoria, *Regiæ Societati Lond.* propoſita. per *Guil. Briggs*. M. D. Editio altera. 1685. in 8°. *The Theory of Viſion, and the continuation of that Diſcourſe, were at firſt inſerted in theſe Papers in* Engliſh: *But the Author, a few Years after, Tranſlated them into* Latin, *and annex'd them to his* Opthalmographia (*in this Second Edition*) *to which they properly belong.*

Ph. Col. n. 6. p. 367. n. 147. p. 171.

n. 35. p. 668. 9. 1. A new Diſcovery touching Viſion; in an Epiſtle of the Diſcoverer M. *L' Abbe Mariotte* of *Dyons* to M. *Pecquet*, and the Anſwer to it. *The Subſtance of both is here inſerted in* Engliſh.

n. 59. p. 1023. 2. The Anſwer of M. *Mariotte* to M. *Pecquet*, about the Opinion that the *Choroeides* is the Principal Organ of Sight; *Engliſhed and inſerted here.*

n. 74. 2217. 3. M. *Mariotte* of Viſion.

n. 149. p. 265. 4. Two Letters of M. *Perault*, and M. *Mariotte*; concerning Viſion. *Paris*. 1682.

ib. p. 259. 10. Traité de l' Organe de l' Ouie par. M. *du Verney*. *Paris*. in 8°.

n. 20. p. 366. 11. Guſtus Organum, per *Laurentium Bellini*, noviſſimè deprehenſum.

n. 177. p. 1244. 12. *Ant. Nuck* de Ductu Salivali novo, Saliva, Ductibus Aquoſis, & Humore Aqueo. *Lugd. Bat.* 1686.

Chap.

CHAP. III.

The Neck. The Thorax.

I. SItting in ſome Company, and having been but a little before Muſical, I chanc'd to take Notice that in ordinary Diſcourſe Words were ſpoken in perfect Notes, and that ſome of the Company uſed Eights, ſome Fifths, ſome Thirds: and that his Diſcourſe, which was moſt pleaſing, his Words, as to their Tone, conſiſted moſt of Concords; and where of Diſcords, of ſuch as made up Harmony. The ſame Perſon was the moſt Affable, Pleaſant, and the beſt Natured in the Company. This ſuggeſts a Reaſon, why many Diſcourſes which one Hears with much pleaſure, when they come to be Read ſcarce ſeem the ſame things.

A Conjecture at Diſpoſitions from the Modulations of the Voice; by ..... n. 140. p. 1010.

From this Difference of Muſick in ſpeech, we may conjecture that of Tempers. We know, the *Dorick Mood* ſounds Gravity and Sobriety; the *Lydian*, Buxomneſs and Freedom; the *Æolique*, ſweet Stillneſs, and quiet Compoſure; the *Phrygian*, Jollity and Youthful Levity; the *Jonique* is a ſtiller of Storms and Diſturbances ariſing from Paſſion. And why may we not reaſonably ſuppoſe, that thoſe, whoſe ſpeech naturally runs into the Notes peculiar to any of theſe *Moods*, are likewiſe in Nature hereunto congenerous? So alſo from the *Cliff*; as he that ſpeaks in *Gam ut*, to be Manly; *C Fa ut*, may ſhew one to be of an ordinary Capacity, tho good Diſpoſition; *G Sol Re ut*, to be Peeviſh and Effeminate, and of a Weak and Timorous Spirit; *Sharps*, an Effeminate, *Flats*, a Manly or Melancholik Sadneſs. He who hath a Voice which will, in ſome Meaſure, agree with all *Cliffs*, to be of good parts and fit for Variety of Employments, yet ſomewhat of an inconſtant Nature. Likewiſe from the *Times*; ſo *Semibriefs* may ſpeak a Temper Dull, and Flegmatick; *Minums*, Grave and Serious; *Crochets*, a prompt Wit; *Quavers*, vehemency of Paſſion, and Scolds uſe them; *Semibrief-Reſt* may denote one either ſtupid, or fuller of Thoughts than he can utter; *Minum-Reſt*, one that deliberates; *Crochet-Reſt*, one in a Paſſion; So that from the Natural uſe of *Mood*, *Note*, and *Time*, we may Collect Diſpoſitions.

II. *Laryngotomy* is highly to be valued, for that in the greateſt Extremity when a Man is in moſt imminent Danger of Suffocation, and to all appearance within a very few Minutes of his laſt, by opening a new paſſage for Breath, it gives ſpeedy and certain Relief, and this when all other Methods fail: and without any conſiderable Injury from the Inſtrument. The Patient in a Minute or two, is brought from the Struggles of Death, to a State of Complacency, Eaſe, and Security. In the large Field of practical Phyſick, perhaps there is not any one Method that works ſo great a Change, for the better, in ſo ſhort a time. But we find this Operation very ſeldom practiſed

An Argument for the Uſe of Laryngotomy; by Dr. Will. Muſgrave. n. 258. p. 398.

practiſed, becauſe that Gap which appears on the Cutting a Throat, (the divided parts being then drawn to their other more fixt Ends;) together with the great Flux of Blood, when the Jugulars and Carotid Arteries are alſo wounded, create in moſt Men a dread of this butcherly Operation; and make thoſe, eſpecially who are unacquainted with Anatomy, ſuſpect all Wounds of the *Trachea*, as Mortal, and oppoſe *Laryngotomy* under all the moſt urgent Circumſtances.

But to wipe off this prejudice, it may be affirm'd that *Laryngotomy* is allowable and ought to be put in practice in violent *Squinzies*, and other Dangers of Suffocation from Cauſes of a like Nature with them. For that the Wound is Curable (notwithſtanding the Authority of the *Encyclopædia Chirurgica* to the contrary) will appear by the following Relation ſent by Mr. *J. Keen* of *Roch* in *Cornwall*, the Chirurgeon who perform'd the Cure.

Nicholas Hobb, of St. *Enodor* in *Cornwall*, Aged 63 or thereabout, was ſometime in *March.* 1696. at a diſtance from any Houſe, ſet on by Ruffians, who firſt by a blow on the *Occiput* knockt him to the Ground; then tranſected the *Trachea* ſomewhat beneath the *Pomum Adami*, together with ſeveral of the Adjacent Muſcles, and ſome large Blood Veſſels; from which he loſt a very great Quantity of Blood, ſeen afterwards lying on the Ground. The Ruffians having robb'd him, and thinking him either dead, or paſt all Recovery, left him. After ſome time the Wounded Man recovers ſo much Senſe and Strength as to thurſt his Neck-cloth into the large and gaping Wound, and by Degrees to crawl home to his own Houſe. When I had examined the Wound, and conſidering the great Flux of Blood, I was much ſurprized that the Patient was alive. *Lipothymies* came frequently upon him, eſpecially upon every little Motion of his Body: Theſe were after ſome time ſucceeded by *Convulſions*. The parts of the *Trachea* were at a vaſt diſtance from each other, the lower part being every turn of Inſpiration ſunk deep into the Neck, as low as the *Claviculæ*, and juſt appear'd upon every Expiration.

There ſeem'd to be no manner of Hopes of his Recovery: however in order to attempt it, I directed a luſty ſtrong Fellow to hold the Leggs of the Patient over his Shoulders, and by this means raiſe them, together with the *Abdomen*, above the *Thorax*, *Collum*, &c. in which Poſture the divided parts came ſo near to each other, that with ſtrong waxed Thread I ſew'd together ſeveral of them: but as to the Diviſions of the *Trachea*, I ſecured them together by paſſing large Needles deep into the Fleſh on each ſide, and Twiſting ſtrong waxed Thread about them as in *Labio Fiſſo*. Over all, for greater ſecurity, I applyed a Reſtrictive (*ex Pulv. reſtring. Clowes*) covering the greateſt part of the Neck with a Defenſative *ex Bolo cum Albumine Ovor.* adviſing the Patient to lye as Quiet as he could. The Patient now begins again to ſpeak, and as well as the Cough, difficulty of Breath, and his Weakneſs would allow, ſoftly and with a low Voice gives an Account of the Occaſion as above.

An *Arteriac* was then made up for him (to ſmooth the *Trachea*, and promote Expectoration) *è Troch. Pectoral. Batean.* (*in Aq. Stephan.* ℥ß *Solut.*)

℥iii. Syr. *Tussilag.* ℥iß. *Balsamic.* ℥i. *Pulv. Anis. Glycyr. ana* ʒi. *Balsam. Sulphur. Terebinth.* ʒ ß. *Pernv. Gut.* vi. *cum Mellis opt. despumat. q. f. fiat Linctus per Bacillum Glycyr. sæpius ad libend.* From the Use of which his Cough abated, and he discharged by Expectoration much Grumous Blood and other Matter. As to the *Convulsions* and *Lipothymies*, I applyed to his Nostrils *Spir. C. C. Succin.* &c. and Embrocated the back part of his Neck with a Liniment *ex Ol. Lil. Alb.* ℥i. *Tereb. Succin. ana* ℥i. *N. M.* ʒß. *Ung. Nervin.* ʒvi. *Mis.*

The next day I found the *Convulsions* had left him; nor had he from that time any return of them, or of the *Syncope*. But on the 4th day the Stitches were torn open, the Wound appear'd large enough to admit a middle seiz'd Hand: a great part of the *Oesophagus* appear'd in View much inflam'd and scratcht by the Instrument. The *Epiglottis* did not as usual, cover the *Rima* of the *Larynx*, so that I could easily see up into the Mouth, part of the *Annular Cartilage* was cut obliquely, and hung only by a little Fibre to the upper part of the *Larynx*, &c. Indeed I met with frequent Ruptures the waxed Thread and Needles often fretting through the Flesh they held; but I as often repeated the stitches in the same manner and method as before. About the 10th Day, the largest Blood Vessels appeared conglutinated and covered with new Flesh; the *Gula* of good Aspect, the Inflammation of that and all the Neighbouring parts gone. I now dresst with *Liniment. Arcei.* On the 11th. Day, the Symptomatick Fever was in a manner gone, and the Wound under the Circumstances of good Digestion. In the mean time the Diet, when he could swallow, was of Mutton-Broth, Ale-Meat, Poacht-Eggs. The Cough continuing a long time very severe, was at length overcome by duly adhering to the *Linctus* aforesaid, with repeated Boles of *Balsam. Lucatel. Conf. Rosar. Rub. Horâ Somni*, with a Draught of a Pectoral Decoction, used also instead of common Drink. To mitigate the violence of it, and procure him sleep, the following *Haustus* was frequently used, and never fail'd our Expectation. ℞ *Ol. Amygdal. Dul. rec. Expres.* ℥ß. *Syr. de Mecon.* ʒvi. *Laud. Lond.* (*Aq. Steph.* ℥ii. *Solut.*) gr. ij. *fiat Haustus Horâ Somni Sumendus.*

About the 11th and 12th Days, we plainly discover'd little portions of new Flesh arising, not only from the Carneous Membrane incumbent on the Gullet, but also out of the Substance of the Cartilages themselves, both on the upper and lower parts of the divided *Trachea*. The external containing parts of the Neck began now to unite by Incarnation; new Flesh arising, and apparently lessening the Dimensions of the Wound, every time there was a Laceration of the Stitches, insomuch that two Needles were now sufficient, whereas I used in the beginning not less than six. And those Carneous portions, both of the *Trachea* and exterior parts, gradually joyning and intermixing, became one solid *Cicatrix* from each end of the Wound almost to the middle of the Wind-pipe, where the Air continu'd in some degree to have an Exit. About the 15th Day I remov'd several pieces of Bones which had contracted a *Caries* in the *Cartilage* (which in this Old Man, as

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in many others, was grown *Osseous*) and were thrust out by the new Flesh. He now swallows with little trouble, eats sufficiently, and nourishes in proportion. The Aperture about the 26th Day was almost clos'd up, and in 4 or 5 Days more the sides of the Wound were perfectly joyn'd and *Cicatriz'd*, the *Trachea* performing its part in Respiration, as at other times, without any considerable inconvenience. He speaks indifferent well, but is forc'd to take care in swallowing, the *Rimula* not being exactly shut as before the Wound, which makes Liquor of any sort more apt to fall into the *Canal*, and so cause a Cough, Hoarsness, *&c.* He does not swallow dry Meats as well as formerly, but in all other respects is as well as ever.

The Structure of the Lungs; by Mr. J. Templer. *n.* 86. *p.* 5031.

III. Having blown into the *Aspera Arteria* of Fowls, I observ'd the continuation of many Vesicles, extended from the *Bronchiæ* through the *Abdomen* to the *Anus*, (which I conceive to be the cause of the constant motion of the *Anus* in Fowls; the Air having Ingress and Egress there:) I thence conjectur'd the substance of the *Lungs* to be a complication of a multitude of Vesicles with the Sanguineous Vessels. And in this Opinion I thought my self confirm'd, by blowing into the *Aspera Arteria* of Quadrupeds, when I had cut off part of the exterior Membrane of one *Lobe* of the *Lungs*, and found the Lungs to rise with unequal Protuberances, not unlike Bladders. But the following Experiment hath much shaken that Conjecture.

Mar. 2. 167½. I made a Ligature about a Dog's Neck, and opening both the Jugular Veins with a pretty large Orifice, I let him bleed to Death, to prevent being overcharg'd with Coagulated Blood. Immediately I open'd the *Thorax*, and tying the *Vena Cava*, with all the Passages from the left Ventricle of the Heart, or its *Auricula*, I cut the *Lungs* with the Heart and *Aspera Arteria* entirely out. To the *Aspera Arteria* I fitted a Syphon, and fasten'd it with a strong binding of Pack-thread. This done, I blew up the *Lungs*, and fitting a Cork to the end of the Syphon, I hung them in a Chimney to dry. In a quarter of an Hour they subsided about a fixth part; whereupon I order'd a Person to watch them, and to blow them up as oft as they subsided. Which course continu'd, they would not the next Morning subside a 4th part in three Hours. And (excepting 3 quarters of an Inch distance from the Circumference of the *Lobes*, where the thinness of the Substance of the *Lungs* gave the external Heat the advantage of a sudden passage, and quick dispatch of drying those Parts least furnisht with Moisture,) I did not perceive, making a proportionable allowance for the drying of the whole Substance of the Lungs, any considerable subsiding in two Days more. But upon the blowing in at the Syphon (whose Ligature I was now forc'd to renew,) I could easily feel the Air to pass through the external Membranes, both on the Convex and Concave Sides, towards the extremity of the Circumference of the *Lobes*; but most abundantly on the Concave Side.

Mar. 5. I carefully cut off one of the *Lobes*, and the inward Structure seem'd like a Cane or dry'd Flag when transversly cut; and upon blowing in at the Syphon, I fancied the Air to come equally out at all the Pores I had

expos'd

expos'd to view. Whereupon I fix'd Spittle in ſeveral places, and upon freſh blowing found multitudes of Bubbles, made in the Denudated parts of the *Lobe*. Immediately I made a deep tranſverſe Inciſion into that *Lobe*, and blowing in at the Syphon, I found the Air to come ſo freely out at the larger Ramifactions of the *Bronchiæ*, that I could not give the *Lobe* a conſiderable riſe with a ſtrong Blaſt: Yet upon ſtopping with my Fingers the larger paſſages of the *Bronchiæ*, which I had cut, I found that *Lobe* upon a freſh Blaſt, conſiderably to ariſe with unequal Protuberances (where the Inciſion was made,) giving no ſmall ſuſpicion of ſome latent Veſicles. Hereupon I ty'd that *Lobe* above the Inciſion, and taking off part of the external Membrane of another *Lobe*, (having firſt ty'd up all the reſt of the *Lobes*,) I pour'd Water into the *Syphon*, and apply'd a ſtrong Blaſt, in hopes to have the Water come forth in ſtreams at all the Pores, but that did not ſatisfactorily ſucceed, it coming out in a confuſed Irroration of the external Surface, without any Ebullition, unleſs at the larger Ramification of the *Bronchiæ*. Then I ty'd up this ſecond *Lobe*, and unty'd a third, pouring in an Ounce of the *Oyl* of *Turpentine*; at the *Syphon* I gave a ſmall Blaſt, and Corked it up. Two Hours after I took off the ſmall Membrane of that *Lobe*, and upon a gentle Blaſt at the *Syphon* found an Ebullition of infinite little Bubbles.

Mar. 10. (having continu'd it to the Chimney,) I cut all their *Lobes* in pieces by different and various irregular Inciſions; whence I could eaſily obſerve the ſeveral Ramifications of the Aerial and Sanguineous Veſſels, with their continuation to the Circumference of the *Lobes*, and a proportionable Diminution as they were at a further diſtance from their original.

Shall I hence conclude the ſtructure of the *Lungs* to be a Complication of a multitude of the Ramifications of the *Bronchiæ* and Sanguineous Veſſels? And that the ſeeming Veſicles were occaſion'd only by the violence of the Blaſt, and the dryneſs of the extreme and ſmalleſt Paſſages of the Aerial Veſſels; whereupon, thoſe neareſt to the *Bronchiæ* (being moiſter) were, more than their ordinary proportion, extended, upon hindrance of a free and uſual Paſſage to the Air in the leſſer Veſſels or their Extremities?

An Experiment concerning the manner of Reſpiration; by Dr. Rich. Lower. n. 29. f. 544.

IV. Pierce the ſide of a Dog between the 6th and 7th Rib in the middle of the *Thorax*, juſt over againſt the Region of the *Heart*, with a ſmall Inciſion-Knife, paſſing the Knife but juſt into the Cavity of the Breaſt (which you may juſtly know by finding no reſiſtance to the point of it); then take it out, and put in a Director, or a ſmall Quill made like it, and thruſt it in about an Inch, directing the end of it toward the *Sternum*, cloſe to the inſide of the Breaſt. Then cut upon it about an Inch on the *Intercoſtal* Muſcles; by which you may be ſecur'd from touching the *Lungs* with the Point or Edge of your Knife. This done, put in your Finger, and with your Nail ſeparate the *Nerve* which paſſeth along the ſide of the *Pericardium* toward the *Diaphragme*. Then put in a Probe, a little inverted at the end like a Hook, and apprehend the *Nerve*, and pull it to the Orifice of

the Breaſt, and cut it off, and ſow the Hole up very cloſe. Do the ſame on the other ſide, and preſently let the Dog looſe, and you will plainly ſee him draw his Breath exactly like a Wind-broken Horſe.

The moſt obvious Obſervations from this Experiment are, 1. That the whole manner of Reſpiration is quite altered. For as in a ſound Animal, in Inſpiration the Belly ſwells by the lifting up the Bowels by the contraction of the *Diaphragme*; and in Expiration the Belly falls by the Relaxing of the ſame: In a Wind-broken Dog, or Horſe, 'tis quite contrary; for in them it is to be ſeen plainly, that when they draw their Breath their Belly is drawn in very lank and ſmall, and when they Breath out, their Belly is relaxt and ſwells again. 2. The Lungs not moving of themſelves at all, but all Inſpiration being made by the Dilatation of the *Thorax*, and that Dilatation being cauſed partly by the *Intercoſtal* Muſcles drawing up the Ribs, and partly at the ſame time the *Diaphragme* by its Contraction drawing downward the lower ſmall Ribs to which 'tis joyn'd, and alſo lifting up the *Viſcera* of the lower Belly, by which they do joyntly make all the ſpace they can for the Air to come in and diſtend the *Lungs*, it muſt hence neceſſarily follow, that where one ceaſeth from its Work, the other for the exigence of Nature muſt take more pains to ſupply the others Defect. So that the *Diaphragme* being made uſeleſs by looſing its *Nerves*, the *Intercoſtal* Muſcles do dilate the Ribs much more than formerly, even to the utmoſt diſtance they can, when there is need for it; as when you make the Dog run a little after he is cut, or when you gallop a Wind-broken Horſe, doth manifeſtly appear. 3. The manner of Reſpiration being the ſame in a Dog, whoſe *Diaphragme Nerves* are cut, and in a Wind-broken Horſe, 'tis more than probable, that the Cauſe may be as nearly the ſame, as the Signs are, and that (for the moſt part if not always) they have their occaſion from the Relaxation or Rupture of the *Nerves* of the *Diaphragme* at firſt.

A Supply of freſh Air neceſſary to Life; by Dr. R. Hook. *n.* 28. *p.* 539.

V. I formerly try'd an Experiment of keeping a Dog alive, after his *Thorax* was all diſplay'd by the cutting away of the Ribs and *Diaphragme*; and after the *Pericardium* of the *Heart* alſo was taken off. But divers Perſons ſeeming to doubt of the certainty of the Experiment, I caus'd it to be repeated at a Meeting of the *Royal-Society* with the ſame ſucceſs; the Dog being kept alive by the reciprocal Blowing up of his Lungs with Bellows, and then ſuffered to ſubſide, for the ſpace of an Hour or more, after his *Thorax* had been ſo diſplay'd, and his *Aſpera Arteria* cut off juſt below the *Epiglottis* and bound on upon the Noſe of the Bellows.

The Dog having been thus kept alive above an Hour, (in which time the Trial was often repeated, in ſuffering the Dog to fall into Convulſive Motions by ceaſing to blow the Bellows, and permitting the *Lungs* to ſubſide and lye ſtill, and of ſuddenly reviving him again by renewing the Blaſt and conſequently the Motion of the Lungs) I caus'd another Pair of Bellows to be immediately joyn'd to the firſt, by a Contrivance I had prepared, and pricking all the outer Coat of the *Lungs* with the ſlender Point of a very

ſharp

sharp Pen-knife, this second Pair of Bellows was mov'd very quick, whereby the first Pair was always kept full, and always blowing into the *Lungs*; by which means the *Lungs* also were always kept very full, and without any Motion, there being a continual Blast of Air forc'd into the *Lungs* by the first pair of Bellows, supplying it as fast, as it could find its way quite through the Coat of the *Lungs* by the small holes prick'd in it, as was said before. This being continu'd for a pretty while, the Dog, as I expected, lay still, as before, his Eyes being all the time very quick, and his *Heart* beating very regularly: But upon ceasing this Blast, and suffering the *Lungs* to fall and lye still, the Dog would immediately fall into dying Convulsive Fits; but be as soon reviv'd again by the renewing the fulness of his *Lungs* with the constant Blast of fresh Air. Towards the latter end of this Experiment a piece of the *Lungs* was cut quite off; where 'twas observable, that the Blood did freely Circulate, and pass thorow the *Lungs*, not only when the *Lungs* were kept thus constantly extended, but also when they were suffer'd to subside and lye still. Which seem to be Arguments, that as the bare Motion of the *Lungs* without fresh Air contributes nothing to the Life of the Animal, he being found to survive as well when they were not mov'd as when they were; so it was not the subsiding or movelessness of the *Lungs* that was the immediate cause of Death, or the stopping of the Circulation of the Blood through the *Lungs*, but the want of a sufficient supply of Fresh Air.

VI. Dr. *Thruston* asserts the chief use of *Respiration* to consist in maintaining a due Motion of the Blood; But the Arguments he produces to make out his Assertion seeming to me Insufficient, I pitch't upon the following Experiment, which I hope will be Decisive of that Matter.

The chief use of Respiration; by Dr. Will. Musgrave. *n.* 240. *p.* 178.

I took a large, middle-aged, healthy Dog; and, having freed the *Trachea* from the adjacent Parts, cut it off just beneath the *Pomum Adami*, and turned the loose end outward. After some time allow'd him to recover the present Concern; with a Cork, got ready on purpose, I stopt up the *Trachea*, binding it close to the Stopple. Some few but violent Struggles succeeded; in which the *Sternum* was raised, as in the deepest Inspiration; and thus he dy'd. From the stoppage of his Breath, to the last motion I could discern in any part of his Body, was, from a Watch, observ'd to be the space of two Minutes. I then immediately threw open the *Thorax*; where I saw the Blood stagnating in the *Lungs*; the *Arteria Pulmonaris*, the right *Ventricle* of the *Heart*, with its appending *Auricle*, and the two great Trunks of the *Cava*, distended with Blood, to a degree excessive: The *Vena Pulmonaris*, left *Auricle* and *Ventricle* of the *Heart*, in a manner empty; not containing (as near as I can guess) more than one Spoonful of Blood.

This Experiment proves, That *Respiration* promotes the passage of the Blood thro' the *Lungs*; and in Bodies full of vigorous Blood, it is, on this Account, of perpetual necessity. This Acceleration of the Blood in that passage, seems to be the principal use of *Respiration*;

no other is of ſuch Conſequence to Life, or ſtands in competition with it.

A Polypus of the Lungs; by Mr. Rob. Clark. n. 235. p. 779.

VII. A poor Man (a Taylor by Trade) has been ill by times this 4 Years, but for 3 Years laſt paſt has frequently Cough'd up ſomething of the Similitude expreſt in the *Figure*. He Coughs them up after a continu'd Coughing of almoſt half a Day or Night, and knows when they come, at the firſt feeling great Pains round his Cheſt; he has voided Hundreds of them, and all alike, though ſome are a great deal bigger, and many leſs than the Deſcription. They don't ſeem, he ſaith, to have Life; but he has preſſed a Slimineſs out of the Body, and ſo through that part which ſeems to be the Head. This had a great many more Fibrils towards the latter end than I expreſt, and ſeem'd to be very Nervous. He is now very Meager, and complains of great Pains about his Cheſt and Back-part anſwerable to it.

Fig. 8.

By Dr. Lyſter. ib. p. 780.

2. Theſe are Figured in the remoter and deeper Branches of the *Aſpera Arteria*: And therefore ſo difficult to get up. They are nothing elſe but the viſcous Excretions of the ſmall Glands, hard bak'd in thoſe Molds, whoſe Form they receive; and may, if we ſtrain a Metaphor, be call'd *Polypus*'s of the *Lungs*.

A Polypus of the Lungs; by M. Buſſiere. n. 263. p. 545.

3. A Boy of 5 Years old dy'd at *Kenſington* of a *Conſumption*. A Year before he dy'd he was troubled with a dry Cough, which continu'd ever ſince, ſpitting now and then a little quantity of Blood; 10 or 12 Days before he dy'd, his Nurſe took notice of ſome thick Skin, as ſhe ſaid, he ſpit out. His Phyſician having examined one of them, found it had the Conſiſtence and Shape of a Veſſel, which made him think it might perhaps be ſome Veſſel of the *Lungs*. The Child being dead, I open'd the Body, and found the *Omentum* quite deſtitute of Fat; ſo were likewiſe all the parts of the Body; the Glanduls of the *Meſenterium* were hardned and blackiſh. In the Left ſide of the Lungs I found a little Purulent Sanies: The inſide of the *Trachea Arteria* was Incruſtated with a ſlimy Membrane, which I took off from the *Trachea* and the Branches in the *Lungs*, inſomuch that that *Pellicula* made a perfect Veſſel from the *Larynx* to the very Extremities of the *Bronchies*, of which it came off very eaſily without breaking either the Trunk or the Branches, juſt as you ſee it in the *Figure*. It adhered to the inward Coat of the *Trachea* only by ſome ſmall Filaments, which were ſo tender that they broke off eaſily, which made me think the production of that extraordinary Veſſel was nothing but the Mucilaginous Humour, which is continually diſcharg'd by the Glandules of the *Trachea*, which being grown more clammy by the Diſtemper was reduc'd to a kind of Jelly by the dryneſs of the Air, which dryneſs not permitting the Spitting it out, incruſtated the inſide of the *Trachea* and *Bronchies*, and growing thicker was at laſt ſhaven off by the violent Fit of Coughing the Child was ſometimes taken with, and then was renew'd again by the ſucceeding *Mucus*. This new Veſſel would not diſſolve in hot Water; The Veſſels of the *Lungs*, that is, the *Trachea* and *Bronchies*, the *Pulmonary* Arteries and Veins were as whole as could be.

Fig. 9.

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This I hope will undeceive thoſe, who believe that Men ſometimes ſpit out the *Blood-Veſſels* of their *Lungs*.

VIII. I cut out the Hearts of two *Urchines*, and found the *Syſtole* and *Diaſtole* to continue full two Hours, while the Hearts lay upon a glaſed Earthen white Plate in a cold Window. The diſtance of their *Diaſtoles* was unequal in time, but very large for half an Hour, and then ſenſibly diminiſhing untill they ceaſed at the two Hours Diſtance; and would not then be reinforced by a Needle's Point, which for the half Hour preceeding they would anſwer at any time. After they had ceaſed above $\frac{1}{4}$ of an Hour, ſo as a Needle pricking them cauſed no motion; yet upon ſetting the Plate upon the Hearth in the Chimney, in about two *Min.* of time they began to beat, though but weakly; and upon 8 *Min.* continuance they beat freely; and when removed into the Window again continued their Pulſation, without Pricking, above an Hour, and might have done longer, could I have ſpared my Servant to attend them longer. Peradventure we may hence Conjecture at the Cauſe of *Life* and *Death*. But when ſhall we ſay any Animal or Inſect is *Dead*, if it hath Motion?

The Motion of the Heart; by Mr. Templer. n. 93. p. 616.

IX. 1. We lately met with a Body, which being opened, the Liquor which is contained in the *Pericardium*, or the Bag of the Heart, was found congealed into a conſiſtence fit to be cut with a Knife, and 2 ſquare Fingers thick about the Heart.

A ſtrange Pericardium; by M. de Martel. n. 58. p. 1184.

2. In *Octob.* 1684. A preternatural *Lump of Fleſh* was taken out of an Ox at *Oxford*. The Weight of the whole Subſtance, cleared from the little Fat, *&c.* adjoyning to it, amounted to $19\frac{3}{4}$ *l.* It very much reſembled a *Heart*: but it was ſomething flatter, and each of the flat ſides made an Equilateral Triangle. The *Baſis* of this *Cone* of Fleſh was 2 Ft. 7 Inches in Circumference, and a Thread drawn round it length-ways from the *Baſis* to the *Vertex*, came to 2 Ft. 9. In.

A Glanduloſe Subſtance found between the Heart and Pericardium of an Ox; by .... n. 67. p. 860.

When we had divided it, cutting from the *Vertex* to the *Baſis* of the *Cone*, and paſſing through both the *Ventricles*, and *Mucro* of the *Heart*, we found the Heart not to exceed the Natural Size: that which was extraordinary about it, being a large *Glanduloſe Subſtance* compaſſing the *Heart* (unleſs where the Veſſels had their paſſage), and ſtretching the *Pericardium* to the exceſs before mentioned. We ſaw no Liquor in the *Pericardium*, nor indeed was there room for any; this *Glaudduloſe Subſtance* taking up all the ſpace between the *Heart* and *Pericardium*, to both which it grew very faſt. It was thickeſt about the *Baſis* of the *Heart*, where it covered the *Auriculæ*, and was $3\frac{1}{5}$ Inches thick; It grew thinner on both ſides gradually toward the *Mucro*, where it was $1\frac{1}{2}$ Inch thick. In the *Septum Cordis* a gritty *Sabuloſe* Subſtance was found, half as big again as a Walnut. In the Lungs were ſeveral *Cyſtides*, containing Matter more or leſs Fluid: One very large *Cyſtis* held ſome Ounces of a Matter not unlike that of a *Steatoma*.

The Butcher who killed this Ox ſays, the *Lungs* grew faſt to the *Pleura*

Pleura on both ſides; which he affirms not to have found once in 40 times in the Cattle kill'd by him. He ſays alſo, that the Ox, tho' not overburthened with Fat, complained much in Travelling; which is eaſy to account for, there being not room for the *Heart* to be diſtended, as it ought, in its *Diaſtole*.

A Polypus in the Heart; by Mr. W. Gould. *n.* 157. *p.* 537.

X. A Poor Labouring Man dyed ſuddenly at *Oxford* in the Street. The Vulgar, which alone convers'd with him in his Illneſs, give this account of him: That he was of a Swarthy Lurid Complexion; He was afflicted with fits of the Falling-Sickneſs; An Obſtinate Quartan Ague of above a Year's continuance; A deep Jaundies, even to that Degree, which is call'd the Black, with its conſtant conſequent an univerſal ſettled Ill Habit of Body; A ſenſe of a hard load and Preſſure at his Stomach (meaning perhaps his Breaſt, or the upper part of the Region of the Liver); He complained much of a very great ſhortneſs of Breath, being almoſt conſtantly apprehenſive of Choaking; far fetcht involuntary Sighings, and prodigious Palpitations of his Heart continually afflicted him; He uſed to Swoon very often; and at length died, according to the Judgment of the By-ſtanders, in the ſhivering Fit of his Ague, with the Convulſions of an *Epilepſy*, not without Foaming and Frothing at his Mouth.

When we open'd him, the *Liver* upon deep Inciſions appear'd Bloodleſs, ſtuft throughout like a bag of Sand with a yellow gritty ſubſtance; The *Gall-bladder* alſo was furniſht with the like, but of a darker hue; The *Spleen* was very large and of too ſoft and looſe a Texture, not much diſcolour'd; The *Omentum* rotten and waſted; The *Membrane* of the *Stomach* extremely flaccid and very thin, appearing black and mortified, and upon taking it out within 24 Hours after Death (tho' ty'd at both ends very cloſe) ſent forth ſuch an intollerable ſowr rancid Scent, that the ſtrongeſt double *Aquafortis* (to which it might be beſt compared) could not prove ſo troubleſome and offenſive to the ſmell; The *Lungs* were diſtended to the uttermoſt with a Purulent Froth; The *Heart* much ſtretched beyond its natural Magnitude, and of a very flat Figure; the *Veins* of the whole Body, were of an unuſual and extraordinary bigneſs, eſpecially the Internal *Jugulars* were ſtrain'd to above $\frac{1}{4}$ Inch Diameter; *Polypous Concretions* alſo were found in the larger *Veins* of the Arms, Legs, and other parts, but that was moſt remarkable which we found in the Right *Ventricle* of the *Heart*, and towards its Apex or Tip firmly Radicated, ſo that no ſmall ſtreſs was required for the Separation. The part A, by which it was fixt, was nigh an Inch and half Diameter when freſh taken out, irregularly rough at the Bottom, inſinuating many Roots into the *Lacunæ* or little Cavities of the *Ventricle*, which again by leſſer Fibres were faſtened to the inner Membrane of the *Heart*. The great Branch B, which ran out into the Right *Auricle* was nigh two Inches Diameter at the largeſt extreme, and reach'd no farther than the Inſertion of the *Vena Cava*. As for thoſe Branches mark'd G G, tending to the Arms, how far they grew I cannot aſſert, not knowing whether they were broke off or no, but the Branches H H H H, *&c.* tend-

Fig. 10.

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ing towards the Head (I well remember) could not be drawn out without ſome force, and 'tis very likely they were broke off at the *Diverticula*, or two round *Sinus*'s where the *Jugulars* enter the *Skull*; for the like Concretions were found in the Veſſels of the *Brain* to which probably theſe might be adjoyned. The Subſtance of the whole was plainly Fibrous reſembling a Nerve, and Tough while Moiſt (though upon Drying, Brittle), the Colour White, and was cloathed with a thin Coat, including (in that part which fill'd the Right *Jugular Vein*,) two little Black Specks *h h*, of Blood (as we ſuppoſe) a long while there Coagulated.

The Cauſe and Nature of a Polypus.

It is a Queſtion much debated by Phyſitians, Whether a *Polypus* is produced ſome conſiderable time before, or always immediately after, Death?

Thoſe that contend for their ſudden Generation after Death, among other Reaſons of leſs Moment, inſiſt much on the Argument drawn from the tough Skin ſpreading it ſelf in a ſhort time on Blood let out for the Cure of *Pleuriſies*, *Peripneumonies*, *Rheumatiſms*, violent *Head-aches*, and in Caſes of any inward Inflammations; and it ſeems a good conſequence that the ſame coldneſs and want of Motion after Death may as eaſily make the ſame Product in the Veſſels, and 'tis to be confeſt that ſuch like Concretions have been diſcover'd in *Pleuritical* Bodies Diſſected. But on the other ſide it may be urg'd, that this Appearance is not conſtant in all Diſſections of Bodies ſo Affected, and that very frequently nothing like it has occurr'd; from whence we have Reaſon to Conjecture, the outward Contact of the Air preſſing the ſurface of the emitted Blood, or ſome other external Cauſe, may have an intereſt in forming that Skin; for elſe why ſhould not the like Concretion proceed conſtantly in the Blood-Veſſels, whence Air is excluded, as well as when the Blood is expoſed in a Porringer. Beſides we find that theſe *Petuitous* Bodies ſcarce ever offer themſelves in Diſſection of *Pleuritical* Perſons, but where the *Pleuriſy* was complicated with ſome other long ſettled Indiſpoſition; ſo that the time of their Growth cannot be certainly collected from ſuch Inſtances; beſides, when they do chance to appear in a ſingle *Pleuriſie*, they float looſe in the Maſs of Blood without fixing to any part, are of a very Lax Texture, without any diſtinguiſhable Fibres, and like what covers *Pleuritical* Blood in a Porringer do rather reſemble a ſtiffer ſort of Jelly or Size almoſt dry'd, than any thing of a tough and Fibrous conſiſtence, ſuch as is obſerved in a *Polypus*.

Kerkringius Aſſerts it in his own Power to make ſuch Concretions at Pleaſure by the known Experiment of *Injecting* Spirit of Vitriol into a Dog's *Veins*, and obſerving the quick Coagulation ſo made, infers that ſome peccant Acid in the Blood, occaſion'd by a Diſeaſe, may as ſuddenly produce the ſame, when Life is gone. To this it may be anſwer'd, that this *Artificial Polypus* is only a kind of Grumous and ſtrongly Concreted Blood, wholy different as to Colour, Texture, and Firmneſs, from that Subſtance we here diſcourſe of. But however, if *Kerkringius* was ſo lucky as to produce one exactly like a true *Polypus* in all Circumſtances, tho it gives indeed ſome light into the Nature of their Cauſe, yet it does not follow that this Cauſe *Anat. Of. 73.*

muſt always work its effect in an Inſtant, but a longer or ſhorter time will be required as the Cauſe is more or leſs Active. In the mean time I do not deny, that ſtrange Coagulations have ſuddenly happen'd, and Anatomy has often made ſuch Diſcoveries in Caſes of ſudden Death; yet even theſe Generally are not to be lookt on as Products after Death, but rather the quick inevitable Meſſengers and immediate Forerunners of it; ſuch are thoſe Concretions that upon Diſſection have been found in the *Heart* and Blood-Veſſels of Perſons kill'd by ſudden *Frights*, as alſo in thoſe that have been quickly diſpatch't by an unexpected Fit of an *Apoplexy*, a *Cardiacal Syncope*, or a ſuffocating *Catarrh*; where the Coagulative Spirit, like Lightning, ſtrikes through the whole Maſs of Blood, and either fixes it and makes it unapt for the generation of freſh Spirits, or elſe, (if a groſs Similitude may illuſtrate ſo Abſtruſe a Matter, (like what happens to the inviſible Steams of Spirit of *Salt Armoniac*, which will be condens'd, grow turbid and viſible, at the approach of the Vapour of Spirit of *Salt* or *Nitre*) the Animal Spirits themſelves are clouded, altered from their Natures, extinguiſh't and quite deſtroy'd, by a mixture of the Foreign Præternatural *Halitus*. 'Tis not improbable, that by one or both of theſe Methods the Peſtilential Effluvia of an Infected Air, the *Arcenical* Exhalation of a Damp, and the *Nitro-Sulphureous* Steam (much like the Scent of *Spirit* of *Nitre*) ariſing from burning Char-Coal, do often act ſuch ſudden and fatal Tragedies. For if we reflect on the Membranous Subſtance of the *Lungs*, the infinite Number of Veſicles they are compos'd of, how that in every aſſignable Point theſe Veſicles are adorn'd with Capillary Blood-Veſſels, ſo that the point of a Needle every where draws Blood; if we calculate the inward Concave Superficies of the *Lungs*, ſuppoſed unfolded and ſpread out into a plain, which muſt needs exceed the outward apparent Convex above an Hundred times, and conſequently conſider the vaſt ſurface of Blood each Moment expoſed to the Air: Laſtly, if we allow the Ingreſs of the Air into the Blood upon Breathing, which ſcarce any now deny; I ſay, if we reflect on theſe things, 'tis eaſy to imagine how ſuddenly miſchievous any Coagulative Poyſonous Steam may prove, ſince together with the Air 'twill be diffus'd through all the Blood contain'd in the *Lungs* at the very inſtant of Inſpiration, and (whether it be Auſtere, or Acid, or both, or what other Name Phyſitians may pleaſe to give it) joyns it ſelf *per minima* with almoſt each Particle of Blood, and preſently deſtroys all Fluidity, ſtuffs the *Lungs* and *Heart* with an immoveable, and almoſt mortify'd, Maſs; puts a final ſtop to the Circulation, and ſo in a Moment breaks off the Series, and Thread of Life. The Concretions that have ſuch ſurpriſing Events we muſt allow to be ſuddenly produced, and we may aſcribe all perhaps to the exceeding briskneſs and activity of the Acid, or what other Quality gave their Origine; but nevertheleſs in the Caſe of Lingring Diſeaſes, I think it will be no hard matter to prove (not to contend that they differ from thoſe already mention'd) that at leaſt they make a ſlower progreſs in their growth, as proceeding from a leſs Active Cauſe, and conſidering the Nature and Conſiſtence of the Bodies themſelves, the Diſeaſes and Symptoms

toms that uſually accompany them, and the Circumſtances of thoſe Diſſections that have diſcover'd them, they muſt needs appear a work of time, and by a daily Appoſition of new Parts, ſwell into that ſtrange Bulk and Shape they ſometimes obtain.

What Conſiſtence theſe Bodies ſometimes acquire, this above deſcrib'd is a very inſtructive Inſtance. The cloſe Fibrous Texture, the tough Membrane that cover'd it, and the two Black hard Specks therein included, its ſtrong Adhæſion to the *Heart* by little Capillary Roots, and other larger Protuberances adapted to all the little Cavities of the *Ventricle*, are Arguments that it was no ſmall time in growing: And if it happen'd after Death, how came it to paſs that the large Branch *B*, ſhould ſtop within the *Auricle*, and that nothing of the like Subſtance ſhould be continu'd farther into the *Vena Cava*, ſince the Blood there muſt needs be as much diſpoſed to ſuch a ſudden Coagulation as in the *Heart*? Laſtly, if to theſe Remarks, we add the Inſtance *Malpighius* gives of a *Polypus* made hollow by the Current of the Blood, like another new Blood Veſſel fram'd with the Natural one; If alſo we add another round one *Borellus* ſpeaks of, bigger than a Man's Fiſt, found in the *Aorta* near the *Heart*, conſiſting of a great many Membranes lying unconnext one upon another, like the Leaves of a Cabbage, (a Product, without doubt, of no ſmall time) we need go no further than the bare Accidents of theſe odd Bodies themſelves to prove their long continuance before Death. And the preſent Subject ſo demonſtrates the thing as to leave no place for doubt: For here we have the *Jugular Veins*, (whoſe Coat could not have been much ſtretch'd on a ſudden, even by the Wind of a Smith's Bellows,) in tract of time, enlarged only by the gentle aſſiduous Preſſings of the Blood to thrice their former Diameter, that is, nine times their Natural Cavity. Here we have a *Heart* (the ſtrongeſt and firmeſt Muſcle of the Body) by degrees form'd into a Shape quite different from the Natural; the Right *Auricle* and *Ventricle*, notwithſtanding the Strength of the Fibres of the latter and their indiſpoſedneſs to ſtretch eaſily, ſo prodigiouſly diſtended, that no outward force whatever without breaking it could effect the like; Such hard ſhift did Nature make to continue the vital Stream, and avoid the fatal Stop, each Moment threatned by the *Polypus*, that with double force ſhe was obliged to maintain a Pulſe; which (becauſe it could not break or expell the unnatural Load,) did by little and little ſtretch the ſides of the *Ventricle*, for the more eaſy paſſage of the Blood, and by terrible Palpitations for a long time protract a miſerable Life, till the Monſtrous Body growing too big, the weaken'd Fibres could ſtretch no more, nor yet regularly contract themſelves any longer; ſo that the *Heart* at laſt, juſt ready to ſink under the Burden, is forc'd to collect its little remaining Strength into one briſk Effort, and aſſiſted by all the Spirits of the Body caus'd the poor Wretch to expire in an Univerſal *Convulſion*.

The Diſeaſes wherein almoſt always *Polypi* may be expected, are the *Apoplexy*, *Phrenſy*, *Falling Sickneſs*, *Convulſions*, *Aſthma* (or difficult Breathing) *Conſumption*, Ill cur'd *Pluriſies*, Ill cur'd and Lingring *Fevers*, *Plague*, *Venerial* Diſeaſes, *Pluriſies Peripneumonies*, *Green-Sickneſs*, *Varices* of the *Veins*, and inveterate *Head-aches*, &c. The part moſt uſually affected is the Right

Ventricle of the *Heart*, and the *Genus Venoſum*, where the Blood returning from the Habit of the Body, ſlow in Motion, impoveriſh'd and diſpirited, more eaſily admits ſuch a Concretion: yet the left *Ventricle*, and the *Genus Arterioſum*, frequently breed the like; ſuch was that *Tulpius* mentions branching out into the *Aorta* and *Vena Pulmonaris*, in a Perſon who died of a grievous *Apoplexy*; and ſuch *Wepfer* makes one great Cauſe of *Apoplexies*. The *Sinus's* of the *Brain* alſo often harbour them, as we have found in one that had an obſtinate *Head-ach*, and at laſt dy'd *Mad*; and not long ſince in another, who once had ſome Fits of a *Frenzy*, and at length dy'd *Epileptical*; in both which Caſes the *Sinus Longitudinalis* was full of a *Polypus*, which emitted very tough Branches into all the little lateral Veſſels: and *Blaſius* gives the like Account in a *Mad-Man's Brain*, who at laſt dy'd *Convulſed*. Upon the ſtreſs of theſe, and many other Obſervations of this Nature, 'tis reaſonable to Aſſert, that a *Polypus* is ſo far from being a Product at the Period of a Diſeaſe, that it ſeems rather a ſtated ſettled Cauſe as well as an immediate Occaſion of the Fatal Symptoms which attend the moſt Incurable Diſtempers; thus if in the *Heart* it grows ſo large as to force a *Diaſtole* beyond the due Tenſion of the Fibres, it produces a Mortal *Syncope*; it ſmaller, and not exceeding the Confines of the *Ventricles*, a ſtrong and irregular Pulſe ſucceeds, and there muſt be a *Palpitation* of the *Heart* to maintain Life; if it ſend Branches into the larger *Pulmonary* Veſſels, the Motion of the Blood is retarded, and the *Breaſt* and *Lungs* labour under their Load in an *Aſthma*: Or if it reaches the Capillaries, a *Peripneumony*, an *Ulcer*, and at laſt a *Conſumption* is at hand; if the Concretion begins in the ſmall Veſſels of the *Pleura*, then a *Pleuriſie* follows; if it grows and fixes in the larger Veſſels of the Arms, Legs, or the like, painful *Varices* appear; and probably *Rheumatiſms* owe much of their Pain to ſome ſuch Concretions begun in the Capillary Veſſels of the Habit of the Body. Again, when theſe Bodies are in the *Sinus* of the *Brain*, if ſmall, the Veſſels will only be a little diſtended, and ſo a Pain in the Head may ſuffice; but if larger, the Obſtruction increaſes, the Blood and Spirits are caſt into an Hurry, the *Brain* is inflam'd, the Senſes preſently are diſorder'd in the Apprehenſion of their Objects, and ſo a *Frenzy* ſeizes the Man; if they chance to be yet bigger and fill the *Sinus* more, the Blood bent up moves more furiouſly, and ſo deſtroys Senſe and all Voluntary Functions; then the Tumult extends beyond the Limits of the *Brain* through the whole Syſteme of the Spirits, and whereas in a *Frenzy* Senſe, though miſtaken, did direct their Paths, now they run *qua data Porta*, Ungovern'd and Impetuous through the Nerves and Muſcles, cauſing the Involuntary Motions and *Convulſions* of an *Epilepſy*, which continue till the Spirits are ſpent, the Blood quiet, and the Blood-Veſſels by the very Agony enlarged equal to their Burden; and indeed in *Epilepſies*, Diſſections ſeldom miſs of a *Polypus*, neither can we deny this *Convulſive* Power of a Concretion in the *Brain*, ſince the great *Lower's* Experiment tells us, That a Dog dy'd in terrible *Convulſions* by injected Milk Coagulated only in his *Heart*: but laſtly, if the *Sinus* prove almoſt totally obſtructed, the Blood inſtantly or'flows the *Brain*, and without much previous notice (except perhaps

haps of Giddineſs, loſs of Sight, or the like) an *Apoplexy* inſues; which Diſeaſe will alſo more dangerouſly happen, when ſome Particles of a *Polypus* in the Left *Ventricle* of the *Heart*, broken off by the violent ſtream of Blood, ſhall be impacted into the *Carotid Arteries* at their inſertion into the *Brain*, whence all Intercourſe of Spirits will irrecoverably be ſtopt. Now tho' in ſome of theſe Caſes a *Polypus* does only by fits diſquiet the Man it poſſeſſes, yet it is in Being when it does not produce ſuch ſenſible Effects; for Exerciſe, Paſſions, Diet, and other External Cauſes, will ſo affect the Quantity and Motion of the Blood, that the Obſtruction may be more inſupportable than when the Stream was calm: and 'tis as eaſy to imagine the Diſorders thus cauſed in an Animal Body, as that a large ſwift River, damm'd up from quietly purſuing its own Channel, muſt needs impetuouſly overflow all the Country about.

And thus we have conſider'd thoſe Symptoms of which a *Polypus* may be rationally thought (at leaſt occaſionally) the next and immediate Cauſe: As for others before mentioned, namely the *Plague*, *Venereal Diſeaſes*, *Lingering Feavers*, and the like, they are not the Effects of a *Polypus*, but Cauſes, that diſpoſe the Blood of ſome Perſons to ſuch *Pituitous* Concretions.

But to diſcover their Cauſe more nicely, we may obſerve with *Wepfer* that Perſons thus afflicted are never well, breath hardly, have frequent *Palpitations* of the *Heart*, unequal Pulſes, are dull to all Action, Stupid, Luxurious and Slothful, of a Livid Leaden or Sallow Complexion, or a Saturated Red in Hands and Face, becauſe there is either very little Blood in the Capillaries of their Skin, or at beſt a ſlow Circulation; their Blood has uſually a Thickneſs, and peculiar *Lentor* in it, or abundance of *Serum*, the latter for want of Volatile Salt to digeſt the *Chyle* into a laudable Red, and the former happens, either becauſe the *Heart*, deſtitute of Spirits for its Pulſe, cannot duly agitate the Maſs, or (as Experiments on Blood emitted ſeem to prove) by reaſon of the Mixture of a Preternatural Acid, whence may infer this conjunct Cauſe of a *Polypus*, that the Fibres of the Blood, not being ſufficiently ſuſtain'd and kept aſunder by a due Motion of the intercepted fluid Parts, may either barely upon the account of Reſt cling together, or elſe may be by degrees connected by an Auſtere Aſtringent Acid (always to be found in *Cachectical* Bodies) for the ſame Reaſon as (an Analogus Liquor) Milk is curdled, only with this difference, that in this, the Coagulation is Brittle, becauſe the Fibres are weak and ſhort, whereas it may be very Tough in Blood, becauſe its Fibres are ſtrong and of a greater length.

Upon the whole we may conclude, That whatever maintains the Fluidity, Motion, Spirit, and Texture of the Blood, promiſes a Cure, though not of a confirm'd *Polypus*, yet of the firſt Rudiments of it. All theſe Indications are anſwer'd by Medicines of Volatile, Briſk, Active parts, which deſtroy Acids, exalt and ferment the Blood, and do not only hinder but alſo diſſolve the firſt Beginnings of Coagulation; and probably, it is by affecting the Blood, and not immediately the *Nerves*, that they do ſuch Feats in Diſeaſes before mention'd. Laſtly, the Effects of Bleeding in ſome Caſes can

never enough be admir'd: Thus *Riverius* tells us of a Girle, 12 Years Old, being Bled plentifully for a *Pleuriſie*, was Cur d of her *Falling-Sickneſs*, a Diſeaſe never without the ſuſpicion of a *Polypus*.

Explication of the Figure.

Fig. 10.

Figure 10. Repreſents the *Polypus*, as it appear'd when freſh expanded on a Board. *A*, That part which was firmly rooted in the Right *Ventricle* of the *Heart*; *B*, The Branch terminated in the Right *Auricle*; *C D D D*, The part tending toward the *Lungs*; *E E*, The Branch running out of the *Ventricle* into the *Pulmonary Artery*; *e e e e e*, The ſeveral leſſer Ramifications diſtributed according to the ſeveral Diviſions of the *Pulmonary Artery*; *F F F*, The Branch belonging to the Deſcending *Vena Cava*; *G G*, The Branches begun in the *Axillary Veins*; *H H H H H*, The two Branches that ran up the *Internal Jugulars* even to their entrance into the *Skull*; *h h*, Two little Black Specks of concreted Blood contain'd within the Coat of the *Polypus*.

A great quantity of Liquor found in the Thorax; *by Dr.* Nath. Fairfax. n. 29. p. 546.

XI. A Maid of *Rumborough* in *Suffolk*, when ſhe was about 13 Years of Age, took *Chalybeats* for the *Green-ſickneſs*, and found ſome Relief by it, but was after much pent in her Wind. From 16 to 22, ſhe much afflicted herſelf with Grief, during which time ſhe had every Year an Acute Diſeaſe or two. At 18, ſhe was very weakly, clogg'd in her Cheſt, and Melancholy. If ſhe went out in a windy Day, the Wind, ſhe ſaid, was ready to choak her. She was a very ſlow Walker, going up Hill or up Stairs with much Difficulty. She was now obſerv'd to be very Thirſty, uſually Drinking at Bed-time, and in the Night too ſometimes, elſe ſhe ſaid ſhe ſhould be choakt with Drought. Between 21 and 22 of her Age, going down Stairs ſhe heard a frighful *Jolking* in her Breaſt. She took ſeveral things of Dr. *Brown*, and others at *Norwich*, for about 6 Months time, without finding Relief. Half a Year after, towards *Michaelmaſs*, upon taking a ſlight Cold, ſhe was ſo ſtopt up that ſhe could only whiſper; nor could ſhe lye flat, but rear'd up with Pillows. I preſenly caus'd a *Vein* to be open'd, and within leſs than an Hour ſhe got Breath, and ſoon after grew as well as ſhe was before. She affirm'd ſhe never ſweat in her Life, nor could it be procur'd by ordinary *Sudoriſicks*. Being deſirous to add an Empirical Remedy, I gave her 3 of *Matthews*'s Pills, which did ſweat her lightly, but beyond whatever ſhe remembred. Several daily Doſes of *Lockyer*'s Pills, 4 *per Doſe*, remov'd the *Jolking*, as ſhe ſaid, lower to the *Midriff*: when ſhe, fearing an *Hyper-catharſis*, laid them by for 2 or 3 Days, and then taking them up again, could find no further Alteration by them. She could never lye on her Left Side. In the 23d Year of her Age, in Winter ſhe, had a dangerous *Feaver*, with a *Diarrhœa*, but came off. In her 24th, in Winter again, ſhe got Cold, was quite ſtopt up, after 5 or 6 Days fell into a *Convulſion* ere ſhe was Bled. By Bleeding, tho' too late, ſhe had preſent eaſe, and cheer'd up in the Evening, but dy'd the next Morning.

When I had laid open the hollow of the *Thorax*, there ſteam'd out a very offenſive Smell, notwithſtanding the ſharp Froſt at that time. The whole

whole Cavity was empty above, (as the Body lay ſupine) and beneath, all the Right Side and about $\frac{1}{3}$ of the Left was fill'd with a Liquor, which took up in the part to the Neckward a Hand-breadth, and ran 3 Fingers thickneſs to the Left of the *Mediaſtinum*. The Liquor was like Cream, or rather like a Size of *Spaniſh-White*, having a caſt of Yellow like Beeſtings; for putting a Spoon into it, from the bottom I took up a thick clammy Matter, juſt like that *Spaniſh-White* that ſinks to the bottom of its Size. In quantity it might be about 3 Pints, contain'd in a Bag which was capable to hold as much more and better. The Bag ran along from the Left Shoulder, to the utmoſt of the Right-ſide of the *Midriff*; not ſtreight along, nor ſtiffly ſtretcht, but about a Hand-breadth from its Riſe it went directly down to the *Midriff*, with which it cloſed all along. Its Skin or Coat was thicker than that of the Stomach, as well as its Capacity larger, inaſmuch as the Flexures of the Ribs joyn'd with it, and made up above half the Compaſs. Where it adhered to the *Midriff*, 'twas near a Finger thick: And in one place, where I endeavour'd to ſeparate it from the *Midriff*, I hit upon a thinner Bag, whence iſſued out 2 or 3 Spoonfuls of ſheir Water. The *Mediaſtinum* was either wholly waſted, or elſe woven into the thickneſs of the Bag, as was alſo the *Pleura*, as far as the Bag reach'd. It lay looſe and flapping from the Left *Axillar* to the Cheſt, having been before fill'd and diſtended either with Wind or the Liquor. All the Hollow was bedabbled with the Wallowing of the Liquor about, as is the *Ouſe* by the Ebbings and Flowings of the Tide in a Channel. That *Lobe* of the *Lungs* which ſhould have been on the Right-ſide was gone, and that on the Left, waſted to near a third part. In the Lower Belly all was well.

The *Folking* was exactly like that of Water or Milk. This Woman was as flat-breaſted as a Man. 'Tis probable, that the Liquor proceeded from the falling down of the *Chyle* from the *Axillars*.

XII. A Noble Peer, many Years ago, was troubled with an extraordinary ſhortneſs of Breathing; his Lordſhip was always better in Bed, or Lying, than Sitting or Standing, quite contrary to other *Aſthma*'s, in which the Afflicted, in Fits, are not able to lye down, the Muſcles of the Breaſt having a freer Motion when in an Erect Poſture. Upon opening the Body, both the Cavities of the Breaſt vvere found full of Water, vvhich vvhen Standing or Sitting preſſed ſo upon the *Diaphragm* that Reſpiration was perform'd with Difficulty, but when Lying that floating Load was ſo diſpoſed that that Office of Nature was better perform'd. This ſeems to be ſo Natural a Symptom, that it may be almoſt an infallible *Diagnoſtick*, to diſtinguiſh an *Hydrops Pectoris* from other more frequent Diſeaſes of the Breaſt, that give a ſhortneſs of Breathing. His Lordſhip, tho' Ancient, was in all his *Viſcera* very Sound.

An Hydrops Pectoris; by Mr. Sam. Doudy. n. 224. p. 390.

Perhaps it may not be impracticable to uſe the *Paracentheſis* in the like Caſe, when the Diſeaſe is certainly known, and without it Death is moſt likely to enſue.

XIII.

Warm Water injected into the Thorax of a Bitch; by Dr. Will. Musgrave. n. 240. p. 181.

XIII. *Jun.* 21. 1683. I Syringed ℥iv. of warm Water into the Right-side of a Grey-hound Bitch, which caus'd a great Rigour (especially in the hinder-parts) a shortness of Breath, a burning Heat in the Flesh; she look'd Heavy, was unwilling to rise or stand long on her Feet. Those Symptoms wore off by degrees, so that in a Week's time she appear'd as well as ever. *Jul.* 2. I injected ℥xvi. of warm Water into the left Side of the *Thorax* of the same Grey-hound, after which she was extreamly Hot, and short Breathed; I felt a violent Throbbing of the *Heart*, but the Rigour was not so great as in the first Experiment; she recover'd this also in the space of a Week. *Jul.* 15. I injected ℔iß. of warm Water into one side of the *Thorax*, and ℔ß. into the other side of the same Bitch; the Symptoms attending it were (as in the former Experiments) a Burning in the Flesh, and a shortness of Breath; they all went off, and in 5 Days time she seem'd perfectly recovered.

Thus we see a Quantity of ℔iii¼. of warm Water has been injected into the *Middle Venter* of the same Grey-Hound, within the space of one Month; and if we may be allow'd to judge of the Recovery by a perfect cessation of all Symptoms, as to outward Appearance, we must then grant, that this Water was carry'd off thence, some way or other, in the same time. I shall only add, that having order'd the Grey-hound to be ty'd away, after one of the two last Experiments, within 2 or 3 Days, I observ'd the Boards of the Floor where she lay to be very wet, which I then imagin'd to be the Effects of the Injection, come off by Urine; Perhaps as Nature hath furnisht us with Vessels to bring off that Humour which is thrown into the *Ventricles* of the *Brain*, and by tarrying there would prove fatal to us, so likewise there may be some *Ductus* yet unknown (to me at least) which belonging to the *Thorax* may convey off thence what Liquor arises (either from the Condensation of Vapours, or from the Rupture of *Lymphaticks*, or any other way,) in the Cavity, mediately or immediately, into the Blood: Certainly these Experiments, as also the many Histories of *Empyema's*, and *Dropsies* of the *Breast*, mention'd by Physicians as cur'd by large Evacuations by Urine, do in some measure argue the probability of such a Passage.

The Passage of Chyle to the Breasts; by M..... n. 65. p. 2083.

XIV. A *German* at *Montpelier* hath discover'd the Vessels, which convey the Chyle to the Breasts of Nursing Women; and shewed that they do issue out of the *Ductus* of M. *Pecquet*.

A sudden and excessive Swelling of a Woman's Breasts; by Dr. W. Durston. n. 52. p. 1047.

XV. *Eliz. Trevers*, 23 or 24 Years of Age, fair of Complexion, brown Haired, of an Healthy Constitution, low of Stature, of Honest Repute, but of Mean and Poor Parentage near *Plymouth*, went well to Bed *July* 3. 1669. and took good Rest and Sleep; but in the Morning, when she awaked, she found her Breasts so Swell'd and Heavy that she could not turn her self in her Bed, or sit up; yet without all Pain and Weakness, either

in

in her Breasts, or in any other part. I advised for the present only an Emollient and temperately warm *Fotus*, and once I gave her a *Bolus*, upon which she had 10 Motions *deorsum*, and the Swelling somewhat abated; but the Maid was so weaken'd upon it for 2 or 3 Days after, that I durst not attempt any thing of that Nature since: *Sed quia passa fuit Suppressionem Mensium per sex retrò Menses, Diuretica nonnulla, & Sanguinis Menstrui Prolectamenta præscripsi.* The *Tubuli* or Pipes of the Breasts are all very hard and Swell'd; and indeed the whole Breasts seem to be nothing else but those *Tubuli*, and little or nothing of Wind or Water. As near as we can guess, the Left Breast weighs about 35 Pounds, but the Right somewhat less. And the Skin of the Back, Neck, and Belly, seem to be drawn towards the Breasts to serve for the Distension. The Circumference of the Right Breast is 2 Foot. 7 Inch. of the Left 3 F. 1 ½ In. The length of the Right Breast from the Coller Bone 1 F. 5 ½ In. The length of the Left Breast 1 F. 7 ½ In. The Breadth of the Right Breast, as it lyes, 1 F. 1 In. The Breadth of the Left 1 F. 4 ½ In.

About the beginning of *September* she brought up, in Coughing, at several times some Blood; but this I soon took off; and at that time there appeared several cutaneous Ulcers upon her Breasts and other Parts, *& abunde in Verendis* (*ut a Fœminis edocebar*), which last I cured; but those on her Breasts in part remain, and daily discharge, by the Sole Application of Cole-leaves, good quantity of Sanious Matter. She complained also of grievous interjuncture Pains, especially upon the *Tibiæ*, whereupon I applyed *Empl. de Ran.* and gave her 3 succeeding Mornings a Dose, which the 3d. Day Wrought, *Sursum deorsum*, pretty briskly; after which her Pains vanisht, and many of those *Vlcuscula*; and her Breasts, which at that time were grown considerably bigger and very painful, much lessen'd; and her Pains also: but *Oct.* 21. She dy'd. The next Morning we took off the Left Breast, and found it of 64 ℔ Weight. Upon the opening of it (in several places) we could find neither Water, nor Cancerous Humours, nor any thing Vitious, more than the Prodigious Bigness; and the *Tubuli* and *Parenchymous* Flesh were purely White and Solid, and no other than what we see in the soundest Breasts of Women, or the best Udders of other Animals. She had lost her Stomach and Rest several Weeks before, and made great Complaints of her Breasts, from their great Distension; and her whole Body was exceedingly Emaciated. The Breadth of her two Breasts (as she was laid out on a Table being Dead,) I mean from the further end of the one to the further end of the other, was 3 F^t. 2 ½ Inches. The Circumference of the Breasts long-wise 4 F^t. 4 Inches. The Circumference of the Breadth 3 F. 4 ½ Inches. The Right Breast we took not off, but we guess it weighed 40 ℔.

Ib. p. 1049.

n. 53. *p.* 1068.

Some time before she dy'd I began a *Salivation* with her, which lessen'd her Breasts in Circumference some Inches; but she proving not conformable, I was forc'd to desist. But she was wonderfully reviv'd afterwards for some time. I then caus'd a *Caustick* to be apply'd, upon which the *Eschar* falling off, yet nothing issu'd out of the Breast. Then an Incision was made 2 ½

Inches

n. 34. p. 1077. Inches deep, but 'twas to no more purpose than the former. I design'd to have examin'd the *Viscera*, but her Aunt (a fond extravagant Woman) disappointed me. But indeed I believe there was little or nothing there extraordinary. For to the last, I could perceive no ill Smell from her Breath, or Streightness upon the Chest, or Painfulness in her Breathing; and the *Egesta per Urinam*, &c. were well enough.

An Aged Woman of 60 Years giving Suck to her Grandchild in Germany; by.. n. 105. p. 100.

XVI. Having taken a Nurse for my little Girle, the Boy of that Nurse having been on that occasion Wean'd, did by repeated Sucking the Breasts of his Grandmother, a Woman of 60 Years of Age, cause such a Commotion in her, that abundance of Milk run to her Breasts for a sufficient Nourishment to the said weaned Boy, whom also my Nurse, his Mother, after she return'd home upon the Death of my Girl, now again gives Suck to, though her Breasts had been for some Weeks dry'd up.

ib. *N. B.* This Relation was sent by a Person of great Veracity: and may be confirm'd by two other like Stories recorded by *Diemerbroeck*, in his *Anatome Corporis Humani. Lib.* 2. *Cap.* 2.

XVII. *A Paper Omitted*, viz.

n. 105. p. 100. A Relation concerning a Woman of 66 Years of Age, who gave Suck to her Grandchild; and another Woman, who recover'd her Milk after it had, for 8 whole Months, been quite dry'd up. *Extracted from M.* Diemerbroeck's Anatome Corporis Humani.

XVIII. *Accounts and Emendations of Books Omitted.*

n. 28. p. 534. 1. Joh. *Swammerdam*, M. D. *Amsterodamensis*, de Respiratione & Usu Pulmonum.

n. 41. p. 833. n. 105. p. 110. 2. Tractatus duo, prior de Respiratione; alter de Rachitide. A. *Jo. Mayow. Oxon.* 1668. in 8o.

n. 56. p. 1142. 3. De Respirationis Usu Primario Diatriba; Auth. *Malachia Thruston.* M. D. Cui accedunt Animadversiones à Cl. Viro in eandem conscriptæ, una cum Responsionibus Authoris. *Lond.* 1670.

n. 142. p. 1072. 4. Αντιδιατριβὴ; sive Animadversiones in *Malachiæ Thrustoni* M. D. Diatribam, de Respirationis Usu Primario. Auth. *Georgio Entio.* Equ. Aur. M. D. *Lond.* 1679. in 8o.

n. 65. p. 2093. 5. An Epistolary Address made to the G. Duke of *Tuscany*, touching the whole Doctrine of Respiration; by *Laur. Bellini.* at *Pisa.*

n. 70. p. 2141. 6. Novæ Hypotheseos, de Pulmonum Motu & Respirationis Usu, Specimen. *Lond.* 1671. in 8o.

n. 127. p. 675. 7. *Joh. Nicolai Pechlinii*, M. D. de Aeris & Alimenti Defectu, & Vita sub Aquis, Meditatio. *Kiloni.* 1678. in 8o.

n. 73. p. 2211. 8. De Catarrhis à *Rich. Lower.* M. D. in 8o.

n. 77. p. 3017. 9. Phthisiologia *Lancastriensis*; cui accessit Tentamen Philosophicum de

n. 206. p. 1005. Aquis Mineralibus, &c. Auth. *Carolo Leigh.* M. D. *Lond.* 1694. in 8o.

10. Tra-

10. Tractatus de Corde, item de Motu & Colore Sanguinis, & Chyli in eum transitu: Cui accessit Dissertatio de Origine Catarrhi. Auth. *Rich. Lower.* M. D. *Lond.* 1669. *Amstel.* 1671. in 8°. *A Correction is here made of an Error of the Press, concerning the Circulation of the Blood, which passeth through the Heart* Thirteen (*not* Six) *times in an Hour; and of a Mistake committed by the Author himself.* *n.* 45. *p.* 999. *n.* 73. *p.* 2211.

11. *Pet. Chirac.* de Motu Cordis Adversaria Analytica. *Montsp.* 1698. in 12o. *n.* 263. *p.* 556.

12. *Ejusdem* Dissertatio Academica; An Incubo Ferrum Rubiginosum? *Montsp.* 1694. in 12°. *Ib. p.* 565.

CHAP. IV.

The Abdomen.

1. SEpt. 14 1678. Opening the Body of a Reverend Clergy-man at *Oxford*, we observ'd the *Liver* to be very large, and fasten'd to the *Diaphragme* more than usually; the *Colon* so firmly joyn'd to the *Liver*, near the Gall-Bladder, that I could not separate it without Incision. The Gibbous part of the *Liver* towards the Right-side, appear'd discolour'd, where making an Incision, there plentifully issu'd out a perfect *Pus*, very Fœtid; as likewise there did from a Wound I made in its Cavous part near the Fissure. This *Purulent* Matter I found not contain'd in any particular *Cystis* or Bag, but in several *Sinus's* in that part of the *Liver*; whereas the other parts seem'd Sound and well Colour'd. This *Abscess* may well be presum'd the Cause of that lurking *Feaver* that took off the Patient, he labouring under it about 6 Weeks, yet without much Complaint of Sickness, but troubled with irregular Heats, yet sometimes such as were imperceptible to himself: Twice or thrice, but at great distances, he had *Paroxysms* of Chill Fits like an *Intermittent Feaver*, but such a *Fœtor* and Dryness in his Throat as prov'd obstinate to all Medicines. His approaching Death was attended with other Symptoms that usually follow the Affection of the *Brain* and *Genus Nervosum*.

An Abscess in the Liver, Stones in the Gall-Bladder, and conjoyn'd Kidneys; by Dr. Edw. Tyson. *n.* 142. *p.* 1035.

Formerly he had been often subject to the *Yellow-Jaundice*, tho' at present nothing thereof appear'd. The *Gall-Bladder* was fill'd and cramm'd with Stones, the *Meatus Cysticus* and *Ductus Communis* even to the *Duodenum* were very much extended with them; and in the *Porus Bilarius* also I met with several small ones. There was no Fluid *Gall* contain'd in the *Bladder*, but some that was soft, of a deep Yellow-Ochre-Colour that fill'd up the Interstices of the Stones. These Stones were of a various bigness, from that of a large Nut, or Nutmeg, to a Pepper-corn: Their Colour was of a darkish Yellow-Ochre, altho' in some there appear'd *Laminæ* of a Browner Colour; To the Touch, when a little dry, they seem'd Soapy; Their Weight was

Light, and their Scent very Fœtid, reſembling that of the *Purulent* Matter in the *Liver*; Their Conſiſtence was Friable; Their Figure for the moſt part Triangular, or inclining to that Figure, but all Angular; That Side toward the *Gall-Bag* was Protuberant and Convex, the other two Sides were Flat; So that having the leſſer Angle towards the Center of the Cavity of the *Gall-Bag*, like ſo many Wedges, they more compleatly fill'd it; I numbred I think above 30. Whether this *Triangular Figure* may be from the ſhooting of ſome *Salts* in the *Gall* is hard to determine: But however, I ſuppoſe, 'twill be found, that they uſually affect this *Figure*; as in ſome others I have by me, taken out of the *Gall-Bladder* of a Woman at *Oxon* ſome Years ago, it does more plainly appear, which are alſo Light, do feel Soapy, conſiſt of *Laminæ*, are of a Whitiſh Colour, not ill Scented as the former, and of a *Triangular Figure*.

Fig. 11. We were ſurpriz'd to obſerve an unuſual Structure and *Conjunction* of both *Kidneys*, the *Parenchyma* of the one being continu'd over the *Spine* unto the other, ſo that they both made but one continu'd Semilunary Body. They were very large, and that part that Conjoyn'd them, and lay over the *Spine*, was ſomething leſſer than the true *Kidneys*, and in its outward Tunicle or Membrane had 3 Seams, although that *Parenchyma* inwardly ſeem'd not to obſerve ſuch a Diviſion, but was the ſame with the Subſtance of the *Kidneys*. The *Emulgent* Veſſels were very numerous; for beſides two larger Veins that were ſubdivided into ſeveral leſſer Ramifications, there were divers other that were ſingle, even to their Inſertion into the *Vena Cava*. The Middle part likewiſe, by which both *Kidneys* were Conjoyn'd, was plentifully provided with Blood Veſſels, for it receiv'd from the *Aorta* two Arteries, which before their inſertion were each ſubdivided into 3 Branches; and it ſent out two Veins, which being joyn'd afterward into one entred the *Vena Cava*. Beſides, at the Seam at the lower part of the Left *Kidney* it had a Vein and Artery, which afterwards inſerted themſelves into the *Iliac* Branches of the *Aorta* and *Cava*; ſo that Nature, though erring from her wonted Rule in forming this Part, yet was Provident in furniſhing it with Veſſels. But to the whole Compages of the *Kidneys* there belong'd only two *Ureters*, but the great Dilatation of the *Pelvis* in each was remarkable; that of the Left *Kidney* was the larger, and had a triple Origination, the Right had but a ſingle one and was leſs.

I am apt to think that this Structure of the *Kidneys* might occaſion as well the great Dilatation of the *Vena Cava*, as alſo of the *Pelvis*: for the Middle part Conjoyning both the *Kidneys*, lying over the *Vena Cava*, by its Weight preſſing thereon would hinder the free return of the Blood, which yet would make room for its ſelf by enlarging its own Channel, which was ſo capacious as to contain 3 or 4 of my Fingers. So likewiſe the *Ureters* running over that part that Conjoyns the *Kidneys*, like Strings over the Bridge of a Viol, in ſome Poſition of the Body they might have their paſſage ſo ſtreightned, that the *Urine* being impeded and regurgitating might ſwell and ſtretch the Membrane of the *Pelvis* to this Greatneſs.

A, The Right *Kidney*. B, The Left. *C*, The Middle part Conjoyning both *Kidneys*. *d e f*, Three Seams in the Tunicle of the *Kidneys*. *G*, The *Arteria Aorta*. *h h*, Two Arteries from the *Aorta*, which afterwards are Ramified into three, and so inserted into the said Middle part. *I*, the *Vena Cava*. *K K*, Two Veins arising from the Middle part, which uniting into one, entered the *Vena Cava*. *L M*, A Vein and Artery arising at the Seam *f*, which at last are both inserted into the *Iliac* Branches of the *Aorta* and *Vena Cava*. *N N*, The *Emulgent* Arteries. *O O*, The *Emulgent* Veins; whereof some are single, others variously Ramified. *P P*, The *Pelves* of both *Kidneys*; that of the Left was extream large. *Q Q*, The two *Ureters*. *Explication of the Figure.*

II. I send you here the Figure of the *Liver* of an *Hydropical* Person. He was about 25 Years of Age, a Soldier in one of his Majesty's Regiments here in Town; who contracted his Distemper by drinking much Water, when he could not stir from his Duty, and catching Cold at Nights in being upon the Guard. He was under the Care of our Physicians in St. *Thomas*'s Hospital for some time, by whose Directions his Swellings did by times abate; but afterwards it was observ'd, that the Method which had been beneficial to others had not here the like success, his Swellings returning upon him as before; so that there was nothing more now to be thought of but a *Paracentbesis*; which Operation however we judg'd very Hazardous, by reason of the time of the Year, and for that the Patient was very much Emaciated; yet he being so much Swell'd that it was uneasy to him to lye in his Bed, he importun'd us very often, and with great earnestness, that the Operation might be perform'd. Hereupon a *Paracentbesis*, by the Physicians consent and directions, was made by me *Nov.* 14. 1685. whereby we drew from the Patient about 3 Pints of Brinish Liquor, and within 4 Days after as much more; the next Morning he died, and his Death, as was found upon Dissection, was partly occasion'd by a Mortification upon his *Scrotum* and *Penis*. Upon Opening the Body, I believe I took out about 24 Quarts of Water; he had a large Inflammation upon the *Peritonæum*; all his other inward Parts not much disaffected, except the *Liver*, which now I am going to describe to you. *A Liver appearing Glandulous to the Eye*; by Mr. J. Brown. *n.* 178. *p.* 1266.

Its Magnitude was not extraordinary, but rather seem'd less than usual. But that which was very remarkable (and I think the like Case scarce ever observ'd by any Author,) and seems much to confirm the Opinion of the Learned *Malpighius*, is this; It consisted, in its Concave, Convex, and Inward Parts, of *Glands*, which (with the Vessels) made up the whole Substance thereof; these *Glands* contain'd a Yellowish *Ichor*, like so many *Pustulæ*, and was I suppose part of the *Bilious* Humour lodg'd in the same, tho' otherwise the *Liver*, between the *Glands*, was of its usual Reddish Colour. In the Bladder of *Gall*, we found a soft Friable Stone, but otherwise nothing considerable in that Part. *Fig.* 12.

A A A, Describes the *Glands* in the Concave part of the Lesser *Lobe* of the *Liver*. *B B B*, The *Glands* in the Concave part of the Greater *Lobe* of the *Liver*; which were of different Magnitudes, tho' in general they were much less in the Lesser than in the Greater. *C C C C*, The inward *Explication of the Figures.*

part of the Greater *Lobe* of the *Liver*, as it was divided. *D D D D D*, are ſeveral Black Specks that appear'd inſerted in thoſe *Glands*, which were probably from the Divarications of the Veſſels being divided upon opening this *Lobe*. *E*, The *Veſicula Fellis*, which was of a Greeniſh-Colour. *F*, The *Vena Porta* ty'd up with the *Ductus Biliarius*, &c. *G*, A particular Set of *Glands*, lodged between the ſame and the *Vena Cava*. *H*, The *Vena Cava*. *I*, Part of the *Ligamentum Suſpenſorium*. The Convex part of the *Liver* was, in every reſpect, the ſame with the Concave part of both *Lobes* as to its *Glands* here deſcrib'd.

The Texture of the Spleen; by S. Malpighi. n. 71. p. 2150.

III. *Lienis* Fibras, quæ tot Ingenia torsêre, nequaquam Nerveas, (quod & Ipſe aliquando autumavi,) ſed Carneas eſſe, deprehendi; ita ut ex Carneo exteriori Involucro, & productis tranſverſaliter Fibris, mirabilis fiat Muſculus, *Lienis* Cellulas comprimens, quo Sanguis per *Splenicum* Ramum propellatur, non abſimili Structura ac Ritu, qualis in grandioribus *Cordis* Auriculis obſervatur: Carnei enim lacerti, per tranſverſum ducti, ſuarum Fibrarum implicatione Rete efformant, Membraneas Cellulas comprimens, ſuiſque extremis Finibus, mirabiliter productis, Carneum Involucrum conſtituunt.

The uſe of the Spleen; by M. Mich. Behm. n. 34. p. 651.

IV. *Lienem* Dn. *Highmorus* & alii merito abſolvunt ab Acido Melancholico, atque Sanguificatione. Vidi aliquoties *Lienem*, calentem adhuc, *Pulmonum* imitari Spongioſitatem, & non Aere ſolum, ſed & coloratis Liquoribus valde diſtendi poſſe; quo facto magis patent ejus Vaſa atque connexiones, Uſuſque a Dn. *Highmoro* expoſiti. De eo tamen, pace Acutiſſimi Viri, modeſte ambigo, an plurima iſta Albicantia Vaſa ſint *Nervi* Spiritu Animali turgentes, vel potius Fibræ Tendinum, Dilatationi & Contractioni ſervientes, uti in *Pulmonibus*. Opinor etenim Sanguinem, qui in *Corde* non ſatis cum Chylo miſcetur, in *Liene* tanquam per Spongiam craſſiorem Colari & miſceri plenius, & aquoſa pauca per *Pancreas* ſeponi, & tandem in *Hepate* iterata Colatione *Bilem* ſecerni. Et quando per Motum aut vehementes Affectus Sanguis in *Corde* nimis ebullit, tunc, ne ille *Cor* opprimat, aut nimio impetu Caput infeſtet, magnam partem recipit *Lien*, ut ejus intumeſcentia cum Pulſu, *Cor* æmulante, & Calore intenſo, à quovis ſentiri queat. A vitiis *Meſenterii* & *Hypochondriaco* Malo, *Lienem* & *Diaphragma* infici credo, ſed nunquam vel raro iſta Mala à vitio *Lienis* provenire putem.

Obſervations about the Spleen, and Liver; by S. Jacomo Grandi. n. 58. p. 1188.

V. In my Anatomical Diſſections of the firſt Year, after I was made the *Publick Anatomiſt* at *Venice*, I met with nothing Curious, but the *Virſungian Channel* manifeſtly inſerting it ſelf in the *Spleen*, and admitting a Silver *Stiletto*; which I had never obſerv'd in any Corps: And then a *Liver* divided into 5 *Lobes*, together with a *Spleen* of the Figure of a Saw, of extraordinay bigneſs. Laſt Year, one Drown'd, of about 35 Years of Age, had the *Lacteous Veſſels* ſo apparent and ſo big, that having ſhewn them how they lay in the Body, I ſhew'd them yet the Day after in the *Meſentery* taken out and diſplay'd upon a Table.

VI. D.

VI. D. *Tho. Sedgwick*, Mercatoris *Lond.* Filia, 14 ſuæ Ætatis Anno, ad Operum Acupictorum Magiſtram ſe erudiendam contulit; in quibus adeo miræ fuit Indolis, ut iis ſolis totos dies, eoſque ferè continuos, per Biennium inſumeret. Hinc *Melancholicum* Temperamentum connatum in Morboſum tranſiit: Cui Pallor, Inappetentia, Menſium Defectus, atque Tuſſis, comitabantur; et poſt tres Annos, gravativus Dolor, in Siniſtro infimoque Latere, qui ad extremum uſque diem perſtitit. Anno autem Ætatis Viceſimo ineunte, ex Febre obiit. In aperto Cadavere, *Pulmones*, *Jecur*, reliquaque *Viſcera*, excepto ſolo *Liene*, ſana inveni. Hoc vero mirum in modum auctum & tumefactum; nempe craſſum ſupra duos Digitos; quatuor latum; longum prope decem. Ita ut, cum *Lien* Humanum, quoties ſe recte habet, vix 5 Uncias pendeat, in hac Virgine 25 ſuperabat. Et cum hoc Viſcus, ſicubi ægrotet, Tumoribus *Schirroſis* & ſubnigris plerumque indureſcat; hîc è contra tota ejus Subſtantia putreſcens, quendam emittebat Fœtorem; molliſque adeò fuit ac Digitis palpantibus diſſolubilis, ut videretur quaſi Grumoſus Sanguis; atque altera pars à prehensâ alterâ etiam ſuo Pondere diſrumperetur. Nihilominus, tam exteriùs quam intùs, Rubicundo floruit Colore, neque ullo *Apoſtemate*, aut Materia verè Purulentâ, inficiebatur.

A Diſeaſed Spleen; by Dr. Nch. Grew. n. 194. p. 543.

In hoc Caſu iſthæc tria ſunt conſideranda, *viz.* Vitæ Genus, Ætas, Ætatiſque Periodus. Primò enim à tam diuturna Exercendi Deſuetudine, vix potuit non evenire inæqualis Alimenti Diſtributio. Quemadmodum itaque Oſſa, & ſæpe Viſcera, ex inepta Nutritione, ſupra modum augentur in *Rhachitide*: Pariter & hic *Lien*, ex eodem Nutritionis Vitio, videtur ampliorem Molem accepiſſe. Præcipue cum Secundò, hâc Vitæ Conſuetudine uſa eſt illa Virgo, non in provectiori Ætate, ſed florente adhuc Adoleſcentiâ. Exercitia enim neceſſaria ſunt, etiam ad debitam Nutritionem: Multo magis ad Partium æquale Incrementum. Tertio, & in illa ipſa Ætatis Periodo, quâ Menſes primò effluere ſolent: quibus inde ſuppreſſis, vel multum imminutis, iſte Sanguis, quem deſidioſa Natura omiſit eliminare per conſuetas vias, ex parte in *Liencm*, quaſi quoddam Diverticulum, rejiciebatur. Virginibus itaque nimia Exercitiorum Intermiſſio, imprimis circa finem Secundi, aut principium Tertii Ætatis Septenarii, peſſima.

VII. Canis Anatome privato quodam *Oxonii Collegio* habita, prope *Lienem* in Orbiculare quid incidimus; quod *Glandulam*, prima facie referebat. Erat illi tres Uncias Diameter; Tunica, qualis Venarum. Hoc illoque latere, Venam conſpeximus, Splenicæ nempe Ramorum alterum, in Orbis iſtius Tunicam, abeuntem. Aperti Carneam obtuemur Subſtantiam; ſed rudem, imperfectam, Grumis interſperſam. Per medium, Iter Sanguini conceſſum. Incrementi tempus diutinum arguit Magnitudo.

A Polypus in a Dog, near the Spleen; by Dr. Will. Muſgrave. n. 266. p. 690.

VIII. As I have opportunity I ſhall ſhew, I hope, that all ſorts of *Glands* (ſo call'd) are nothing elſe but Veſſels, (and their Liquors) variouſly wrought, and Receptacles of ſeveral Liquors for divers uſes; the difference

The Structure of the Glands; by Sr. Edmund King. n. 52. p. 1046.

difference of which alters their Colour, Conſiſtence, *&c.* My meaning is, that there is in no reputed *Gland* any other thing than in the Body of the *Teſtis*, *viz.* That it hath not this or that intermediate Subſtance, but that the Liquors regularly come and go to and through them in fine Tubes, (in ſuch and ſuch Heaps and Figures, as may make them appear ſo and ſo form'd in ſeveral parts of the Body, where they are ſituated ;) as alſo, that the more conſpicuous Veſſels of the Body have other Veſſels that help to make up their Coats, and ſerve for the Nouriſhment of the ſame, beſides ſuch as import or export thoſe Liquors, for the Conveyance of which they were deſign'd for common Uſe.

The Uſe of Glands; *by* Gaſp. Bartholine. *n.* 164 *p.* 753.

IX. Illa, quæ de *Pancreatis* Ductu ejuſque Succo Recentiorum diligentia invenit, viam aperuerunt reliquarum *Glandularum* & Vaſis inveniendis & Uſui agnoſcendo. Nec enim amplius habenda eſt *Glandula*, ubicunque in Corpore noſtro reperiunda, pro parte Corporis vel otioſa, vel ſuperfluis humoribus deſtinata, ſed potius quaſi pro Cribro quodam ſecernente a Sanguine Humorem conſervationi Individui maxime neceſſarium. Nimirum cum per Arterias ad ſingulas Corporis partes deferatur Sanguis, & antequam per Vaſa Capillaria Venarum ab iiſdem redeat, varias in nonnullis partibus deponat particulas, quæ per Vaſa peculiaria (Excretoria communiter dicta Anatomicis) excluduntur, proprie Cribi nomen meretur illa circumfuſa materia, quæ inter Capillaria Vaſa Arteriarum & extrema Oſcula Vaſorum Excretoriorum intermedia eſt, quæque efficit, ut tranſitus fiat, non totius Sanguineæ maſſæ, ſed quarundem ſaltem ex ea ſecretarum partium, diciturque alias *Parenchyma*, affuſio, vel caro Viſcerum. Ita in Sanguine, poſt diverſorum Humorum in ſe mutuam actionem, diverſi generis particulæ à tota maſſa ſeparatæ, in ſingulis Cribris ſibi convenientes meatus inveniunt. Et qui bene hanc generalem Cribri deſcriptionem animo comprehendit, ſimul intelliget Viſcerum omnium, quæ Vaſe Excretorio prædita ſunt, conformationem. Talia autem ſunt illa Viſcera quæ vulgo *Glandulæ* vocantur, quæque recepta hactenus diſtinctione dividi ſolent, ratione conformationis, in *Conglobatas* & *Conglomeratas*.

Conglobatæ Glandulæ illæ dicuntur, quæ æqualem habent ſuperficiem, ex una quaſi ſibi continuata ſubſtantia conflatæ, & quæ Excretoria habent ejus generis *Lymphatica* Vaſa, quæ à *B. M.* Parente meo quondam inventa & deſcripta ſunt. Illorum autem *Lymphaticorum* per *Glandulas* has *Conglobatas* talis obſervatur Diſtributio. Quædam à primis ſuis Fontibus in *Glandularum* ſuperficiem ſparguntur; quædam à concava parte unius *Glandulæ* in alterius convexam partem pergunt; quædam iterum ab earundem *Glandularum* parte concava ad locum inſertionis in *Venam Cavam* exporriguntur, idque vel immediate, vel per intermedium *Thoracicum Ductum*. Ita omnia hæc *Lymphatica*, quæ à Sanguine ſecretum in *Glandulis Conglobatis* Humorem excernunt, eundem in Sanguinem iterum facto quaſi Circulo reducunt. Reperiuntur tales *Glandulæ* in *Meſenterio* inter vaſa excipientia Chylum ab Inteſtinis & Receptaculi Lumbaris radices circa Venam *Portam*; inter *Lymphatica Hepatis*, & ejuſdem Receptaculi radices; in Lumbis, Inguinibus, circa

Pulmo-

Pulmones, in Maxillis, in Collo, ſupra Fauces, ſub Alis, in *Omento*, alibique. Memini me quondam in *Noſocomio Florentino*, in Fæminino Cadavere, *Glandulas* duas *Conglobatas* cum ſuis *Lymphaticis* inſignis atque notabilis magnitudinis inter Cutem & Muſculos *Abdominis* in Ilio Siniſtro in pinguedine reperiſſe. In alio *Hydropicæ* Cadavere, ibidem à me aperto, *Abdominis* Cavitas aqua copioſa repleta erat, *Glandulæ* verò omnes, quæ ubique latitantes præter ſolitum multiplicatæ, mihi videbantur Schirroſæ & Materia Purulenta refertæ : Mirari ſubiit inſolitum *Glandularum* numerum & magnitudinem præternaturalem. Et quod ad hanc attinet, illam materiæ contentæ, in hoc Affectu ita *Glandulas* diſtendenti, attribui. De inſolito verò *Glandularum* Numero dubium habui, an ullæ in corpore *Glandulæ*, non ibi ante exiſtentes, novæ procreentur, an verò antea parvæ ſolum & quaſi *Miliares* latentes, ita interdum augeantur ut oculis clarius paterent, quemadmodum de Mammarum *Glandulis* certum eſt, quæ in omnibus dantur, ſed in aliis conſpectiores ſunt.

Certe *Conglobatarum* vera notitia non parum inſervit Affectui difficili explicando, nimirum Scrophulis, & iis quæ circa Scrophulas obſervantur. Non raro enim videre contingit ingentes ſacculos intra *Conglobatas Glandulas* contentos, plenos Materia vel Flaveſcente vel Gypſea ; adeoque facile agnoſcitur craſſiores Lymphæ partes, dum per *Glandulas* Cribrantur, nec tranſitum patentem inveniunt, ſenſim ibi collectas ſacculos formare. Quod vero dicunt de conſenſu *Glandularum* Colli & *Meſenterii*, dum ut plurimum exiſtentibus in Collo Scrophulis ſimiles etiam in *Meſenterio* reperiuntur, non fit per communicationem quandam immediatam inter Collum & *Meſenterium*, aut per occultas Sympathias, ſed idem Sanguis in omnibus ejuſdem Naturæ *Glandulis* ejuſdem generis Contenta deponit. Unde ſequitur, quod Materia exiſtente Pauca, vel una tantum afficiatur *Glandula*, vel multæ ſimul, ſed obſcurè : Materia autem exiſtente Copioſa, plures ſimul *Glandulæ* eadem repleantur ; atque mutata deinde Sanguinis natura per liquores reſolventes, reſoluta in *Glandulis* dicta Materia, Humores evaneſcunt.

Conglomeratæ Glandulæ ex variis quaſi partibus & minoribus *Glandulis*, cum aliqua ſuperficiei inæqualitate, conſtantes, ſola *Lymphatica* evehentia habent, ſed alterius plane generis ac priora illa, quippe quæ in peculiares cavitates liquorem, à Sanguine in *Glandulis* Secretum, immediate deponunt ; ut *Salivales* in Oris cavitatem, & *Pancreaticæ* in Inteſtinum *Duodenum*. Atque hujus generis *Glandulæ* omnes, quarum ſaltem Vaſa Excretoria hactenus nota ſunt, ſuppeditant humorem, quo mediante aſſumptorum prima reſolutio inſtituitur. Unde in Ore præcipue & per totum Ductum viæ Alimentorum tales *Glandulæ* vel parvulæ varie ſparſæ, vel in Corpora inſignia coagmentatæ reperiuntur. Et ſi quæ videantur extra Canalem Alimentorum ſitæ, ut *Glandulæ* Oculorum & Narium, tamen ubi illarum humor Palpebras inunxerit & in Nares delapſus (per Vaſa dicta olim puncta *Lachrymalia*) cum Narium humore particularum Odoriferarum perceptioni ſervierit, in Canalem Alimentorum (per viam à Naribus in Os patentem) tandem derivatur, quo etiam ex Naribus effluens humor deducitur.

Ipſam

Ipſam *Glandularum* Structuram ſi attingamus, utique multa nobis imponere ſpecie Carnis, communiter ita dictæ, deprehendemus, quæ revera ſunt Vaſa Excretoria, uti contingit in Renibus, monente *Malpighio.* Etenim quemadmodum in Renibus peculiaris illius Subſtantiæ, quam pro Carne habuerunt Antiqui, maxima pars conſtat ex minutis canaliculis & meatibus, per quos Urina in Pelvim affluit, & quibus circumpoſitum eſt verum Cribrum Glanduloſum pro ſecernenda Urina ; ita etiam magna pars illius Subſtantiæ, quam quaſi peculiarem Carnem vel Parenchyma in *Glandulis* conſideramus, componitur ex variis Tubulorum Glomeraminibus & Vaſis Excretoriis Lymphaticis, Nervis, Vaſis Sanguineis, addo & Fibris Carneis, quibus non ſolum inveſtiuntur *Glandulæ*, ſed & eas Subſtantiæ ſuæ intertextas habent.

The Spiral Structure of the Fibres of the Inteſtines; by Dr. Will. Cole. *n.* 125. *p.* 603.

X. The Mechanical reaſon of the *Periſtaltick* Motion of the Inteſtines is by ſome Anatomiſts deduced principally from *Annular* Fibres, conſtituting, according to the received Doctrine, one of the Coats of them. Others are of Opinion, that they are rather numerous though ſmall *Sphincter* Muſcles than ſingle Fibres, to which that Motion is to be attributed; Muſcle being in moſt, if not all other Inſtances own'd to be the adequate Inſtruments of Motions Analogous to this; and Fibres, though abſolutely neceſſary, yet being no otherwiſe ſo than as (a number of them being collected, and fitly diſpoſed) they conſtitute a Muſcle. But I found it very difficult to conceive how the Actuating Matter could be tranſmitted from one Fibre or Muſcle to another down along the whole Tract of the Inteſtines, ſince, according to this *Annular* Suppoſition, each ſingle Fibre or Muſcle muſt be diſtinct, a latent Contiguity being all that can be pretended. This, and many other Difficulties which occurr'd to me, put me upon a ſtricter Examination. I made the firſt Experiment in a portion of the upper *Inteſtines* of an Ox, which by reaſon of their largeneſs of proportion to thoſe of moſt other Species of Animals, ſeem'd fitteſt for the Tryal; afterwards in t hoſe of Sheep, and Calves, and not only in the ſmaller *Inteſtines*, but in the *Colon* and *Cæcum* alſo. The Circumſtances and Reſult of which Tryals are as follow.

To effect a due Diſ-junction of the Membranes and Fibres (which I found 'twas hard, if not impoſſible, for me to make while 'twas raw) I was fain to cauſe the *Inteſtines* of Oxen to be boil'd 5 or 6 Hours, of Sheep 4; whereby the Compages of the Parts were ſo looſen'd, that the two outward Coats, *viz.* the common one and that conſiſting of *Right* Fibres, were eaſily ſeparated (if it were attempted ſoon after it was taken out of the Water) from that to which my ſearch was deſtined, and left thoſe reputed *Annular* ones naked; (though, by the way, too long Coction would prove prejudicial on the other hand, by too much intenerating the Fibres.) Theſe at the Top of the *Inteſtines*, I attempted to ſeparate from one another, and when thoſe that had been decurtated by the unequal Cutting of the Knife, were taken off, I found,

1. That

1. That I could not ſeparate a ſingle Fibre from his fellows to any conſiderable diſtance, all of them (to my Obſervation) being very ſmall, and in the ſeparation running ſmaller and ſmaller, and withal by reaſon of their Implication or ſtricter Coheſion one with another eaſily breaking; but a Congeries of them, (to be obſerved eſpecially, though not preciſely always, in thoſe places where by gently extending the *Inteſtine* ſeveral times, and then letting it return again, the Coheſion of the ſeveral Series of them became looſen'd) which at firſt View would reſemble a pretty large Fibre, would without much difficulty riſe together; the very ſmall conſtituting Fibres of which Cluſters yet, if the Boiling had been very long continued, whereby the Compages was very much relax'd, would in the raiſing be very apt to ſeparate from one another, and appear diſtinct by reaſon of their Inſertion by and by to be mention'd.

2. That when beginning at the top, I attempted the Separation of one of theſe (ſuppoſed *Annular*) Cluſters of Fibres towards my Right Hand (on that ſide of the *Inteſtine*, I mean, which was turn'd towards me) a whole Ring would come off together, (excepting that ſome Fibrillæ, which riſing from contrary Parts, decuſſated one another at the Top in that *Phaſis*, would a little retain it) but endeavouring it towards my Left, I found, for the moſt part, I could eaſily enough unravel that Cluſter to a conſiderable Length, *viz.* that of ſometimes more than 2 or 3 Spans, before Ruption (of the whole Cluſter I mean) which yet at laſt 'twould be ſubject to. For,

3. Though thoſe Convolutions, as to the greateſt part of them appeared diſtinct, yet I found, that from every one of them, at ſhort Diſtances, ſome Fibres did obliquely, and the moſt of them, to my beſt Obſervation, according to the Courſe of thoſe I have mentioned, inſert themſelves into the next Convolution, and become a part of it; though withal ſome I obſerved to have a contrary Tendency, or rather ſeem'd to aſcend from the lower to the upper Convolution, and help to conſtitute it, and ſo to obſerve the Courſe mentioned; nay ſometimes would go further than the next Convolution, and running under it, apply themſelves obliquely to ſome higher, which yet being in a ſmaller Number than the reſt that lay in the Order contrary to them, did not very much hinder the Diſſociation of the main ones: Which Fibres breaking off, and that in ſome places in greater Numbers than in others, would at laſt (and the ſooner if the *Inteſtine* began to grow dry, which it would quickly do) cauſe the whole Cluſter to break off.

4. I obſerv'd, that as the moſt of theſe Fibres would by degrees, according to the order of the Convolutions, inſert themſelves into the next, ſo ſome of them would (in the ſame order) paſs over it, and more (ſo far as I have obſerv'd) would run under it, and either adjoyn themſelves to ſome more remote, or elude my ſearching by hiding themſelves under them. This Inſertion of theſe Fibres ſeems to be the Reaſon of the *Annular Phaſis*, that I mention'd even now, in the contrary way of ſeparation: For the attempting it contrary to their order, muſt hinder in ſome meaſure the ready Diſſociation of the next Convolutions upwards; eſpecially near the ſevered extremity, where there is leſs reſiſtance of the adjacent parts; the

mentioned Fibres alſo ſeeming ſomewhat bigger, and conſequently ſtronger in the upper, than after their Inſertion into the lower Convolution: Though indeed,

5. I found, that if I began at a lower part of the *Inteſtine*, and try'd to unravel upwards, there was not much more Difficulty in ſo doing, than when beginning above, I attempted it downwards; of which the Reaſon, I ſuppoſe, might be the tenderneſs of the Part occaſion'd by long Boiling, whereby I could not perhaps judge of the Degrees of Renitency in thoſe ſmall Fibres. In this contrary way of Separation too, the Operation, I obſerv'd, would not ſucceed unleſs I attempted it in the contrary order, *viz.* towards my Right Hand.

6. When before Boiling, I cauſed the inſide of the *Inteſtine* to be turn'd outward, as I did in two Tryals, and afterward by taking off the Glandulous and Vaſcular Coats (which I think to be diſtinct from one another, as I ſaid before of thoſe conſiſting of Right Fibres, and the ſuppos'd *Annular* ones,) endeavour'd to unravel the Fibres, I found they would come off in the contrary Order, *viz.* from my Left Hand toward my Right; which I conceive confirms the Obſervation above deliver'd, in regard the *Inteſtine* being inverted, the order of Separation muſt be ſo too; though I found (or thought) the Operation more difficult, by reaſon of ſome Fibres lying in the oppoſite order (mention'd under the 3d. Particular) and in this appearance lying uppermoſt.

7. In one of theſe Attempts of unravelling the Fibres of the *Inteſtine* of an Ox, ſo inverted, I found, that though the Fibres I took up came off in the order I juſt now mention'd, yet running over ſome others, they made a more oblique Excurſion, and for 2 or 3 Convolutions left betwixt them a conſiderable Area of Fibres, amounting (according to my Conjecture) to 5 or 6 times, or more, the breadth of thoſe that ſo came off, till going deeper and deeper among the other Fibres, and at laſt running under them, they could be no longer traced, but brake off. Whether this be uſual, or only *Luſus Naturæ*, I cannot determine.

8. I found it much more difficult (in that one Tryal I made) to unravel the Fibres of the *Cæcum* than the other *Inteſtine*, which ſeem'd more interwoven than thoſe of the reſt, and to have contrary Tendencies one among another.

This is the ſum of my Obſervations hitherto concerning this Coat, which I take leave to think one *Concave* and *Helical Muſcle* (if I may ſo ſtyle it): And that it might be ſuppoſed ſuch, the fore-mention'd Inſertions ſeem'd to evidence, they appearing to me in the Separating appoſitely enough to repreſent the Fabrick of a Muſcle deliver'd by the accurate *Steno*. Where the Tendons of it are fix'd, is not evident; but if I may have the liberty to Conjecture, I ſhould think the upper of them to be radicated (at leaſt) at the *Pylorus* (if not as high as the *Sphincter Gulæ* (if this be not it,) ſince the carneous Coat of the *Stomach* being by the Learned Dr. *Willis* found to be a Muſcular Contexture, and there being a Continuation of Motion between that part and the *Inteſtines*, it ſeems to me not altogether improbable

improbable they may be but one Muſcle; and the other at the *Anus*.

The Motion of the Stomach *and* Guts; *by Dr.* Chr. Pitt. *n.* 243. *p.* 278.

XI. In the Diſſection of a Dog, in *July*, 1685. I obſerv'd, that the *Periſtaltick* Motion of the *Guts* was continu'd thro' the *Stomach*; the *Pylorus* (that uſually appears, after opening the Dog, as high as the *Diaphragme*) being in every waving brought below the very bottom of the *Stomach*, I could manifeſtly obſerve a Conſtriction in the Middle of the *Stomach*, at every Motion downward, paſſing it in ſo as to be able to compreſs what was contain'd in its Cavity. And theſe Motions were as regular and orderly as ever I ſaw it in the *Guts*. I have ſince ſeen the ſame Motion in 2 or 3 others; ſo that one may ſafely conclude it holds true in all. The Motion of the *Stomach*, being after this manner, may give us a clear Account of the Quickneſs of the Diſtribution of the Nouriſhment; the Meat being no ſooner open'd by the Spittle and Liquor that we take in, than that it has a free Motion by the Deſcent of the *Pylorus* into the *Inteſtines*, which is almoſt *pleno flumine* from this Compreſſion in the Middle of the *Stomach*.

The Cure of a Horſe ſtaked into his Stomach; *by Dr.* J. Wallis. *n.* 219. *p.* 178.

XII. My Son (Mr. *J. Wallis* of *Soundeſs* by *Nettlebed* in *Oxfordſhire*) had a Horſe which in Harveſt-time 1695, leaping over a Hedge, chanced to ſtake himſelf very dangerouſly. A Boy being ſent for him rode home upon him about 4 a Clock without diſcerning the Hurt, till (upon his alighting) he found his own Legs bloody, and then diſcern'd the Wound, ſomewhat behind the Fore-Legs, a little inclining to one ſide. When the Farrier (*Tho. Biſhop* Jun. of *Wallingford*) came, which was not till after 10 a Clock that Night, he ſearch'd the Wound, and after he had enlarg'd it in the outward Skin and Rim of the Belly, he found a Wound in the *Ventricle* or *Maw* at leaſt 3 Inches long; he then remov'd the *Maw* outward, and order'd a Servant to cleanſe it from the chew'd Graſs and whatever he found in it, as being leſs likely to Gangreen when empty. The *Maw* being thus cleans'd, the Farrier ſowed up the Wound therein, and then thruſt it back into the Body; and then ſewed up the Wound in the Rim of the Belly: The Wound in the outward Skin he did not ſow up, but only tack'd it looſely together about the middle, leaving room on both ſides to put in Tints and Medicines for the healing of it. The Horſe after this continu'd for ſome time much indiſpoſed, but in a Month or 6 Week's time (with careful attendance) the Wounds were clos'd and perfectly cured; and the Horſe work'd at the Plough and other Services as before.

A Knife cut out of the Stomach; *by Mr.* William Clerk. *n.* 250. *p.* 97.

XIII. Amongſt the Rarities in the *Anatomy-Hall* at *Leyden*, there is preſerv'd a Knife 10 Inches in length, which was cut out of a Peaſant's *Stomach*, and he liv'd 8 Years after.

A Knife Swallowed by a Lad in Saxony; *by* .... *n.* 219. *p.* 180.

XIV. *Jan.* 3. 1691. One *And. Rudloff*, a Country Lad near *Hall* in *Saxony*, about 16 Years of Age, playing Tricks with a Knife in his Mouth, it accidentally ſlipt down his Throat into his *Stomach*. The

Knife was in all about 6½ Inches long with a Harts-Horn Haft: The Curiosity of the Case did oblige M. *Wolfgang Christ. Wesenern*, Physician to the *Elector* of *Brandenburg*, to take care of him. The Knife was felt to have chang'd its Position several times, and after a few Months ceas'd to be very troublesome, and in about a Year was so much diminish'd, as to be difficult to be felt from without. Not long after an angry Tumour with Inflammation broke out 3 Fingers breadth below the Pit of the *Stomach*, which being Ripen'd, the *Apostbem* was open'd *May* 24. 1692. and being kept open, the Point of the Knife first appear'd thereat *Jul.* 18. following. The Point they fasten'd with a Silk-Thread, and the Wound being widen'd, the Knife was drawn out thereat *Aug.* 2. (a Year and 7 Months after it had been swallow'd) and in a little time the Lad was perfectly well. The Knife was exceedingly consum'd in all its Dimensions.

Two Copper-Farthings swallowed by a Child in Worcester; *by Mr.* Hen. Underhill. *n.* 246. *p.* 424.

XV. About 10 Years ago my Son, *Will. Underhill*, Aged about 3 Years, swallow'd by accident two Copper Farthings, but half a Year one after the other. Upon the first Farthing, he eat nothing for 10 Days, and complain'd of a great Pain at his *Stomach*, and drivel'd as if he had been Salivated; and often said he had a Nauseous Venemous Taste in his Mouth, the Farthing not coming from him in half a Year. After the swallowing of the second Farthing he began by degrees to lose his Limbs, his Breast growing narrow, and the Child Consumptive; who was after perfectly cur'd by the *Bath*, and his Breast dilated and grew broad as before.

A Disease caus'd by swallowing Stones; by Sir Ch. Holt. *n.* 253. *p.* 190.

XVI. 1. In *Feb.* or *Mar.* 169⅘, one *Tho. Gobsill* of *Shelden* near *Coleshill* in *Warwickshire*, (a Lean Spare Man, aged about 26 or 27) told me, that about 3 Years before he was extreamly tortur'd with Wind: And one Day making a complaint to an Old Woman in the Neighbourhood, she advis'd him to swallow round white Pebbles, which he did as oft as he had occasion, and the Stones passing easily through him he found great Relief. But after some Months being seiz'd with a violent Fit, he swallow'd as usually about 9 Stones; which not passing he repeated the Dose till he had taken above 200. He had these Stones in him above 2 Years and a half when he first came to me, and then complain'd, that his Appetite was gone, that he could Digest nothing, but threw up every thing he eat. Upon examining his Belly I found the Stones lay almost as low as the *Os Pubis*, and thrusting my Fingers just above that Bone, so that the lower part of the *Abdomen* might lie on my Hand, I could with the Motion of my Hand shake them and make them rattle, as if they had been in a Bag. Hereupon I caus'd a Ladder to be set against a Wall, and hung him by the Hams upon it with his Head downwards; when in this Posture, he told me, the Stones were got up to his *Stomach*; but being set down upon his Feet, after a very small time, we could plainly hear the Stones drop distinctly one after another.

If his Body be not *Laxative*, he Vomits all he Eats or Drinks; to prevent which he commonly keeps it open with Whey. As he lies in Bed the Stones will

will ſometimes get up (as he expreſt it) almoſt to his *Heart*, and give him great Diſturbance; at which times he is forced to get upon his Knees, or to ſtand upright, and then he can hear them drop, as is before mention'd; and at ſuch times he can always count above an 100. He is ſo diſabled by theſe Stones that he cannot Work but in Pain, and then he finds the ſame Night and the next Day a great Soreneſs in the Bottom of his Belly, and Voids large Quantities of Blood by Stool. He has been under the Hands of ſeveral Quacks: Some had Vomited him with *Stibium*, and Purged him; others Purg'd and Gliſter'd him; but all the forcing Medicines they made uſe of could never bring one Stone from him.

2. Some People (who ſee Birds Languiſh unleſs they ſwallow Gravel or ſmall Stones) take up an Opinion, that the ſwallowing Stones helps the *Stomach* to Digeſt their Food. But I have been always againſt this Practiſe; Becauſe though the *Stomachs* (or *Gizzards*) of Birds (they wanting Teeth to grind their Food) is made very ſtrong, Muſcular, and defended in the inſide with a Coat, by the help of which and theſe Stones their Victuals are ground: yet the *Stomachs* of Men being very different, 'tis not reaſonable to think they ſhould be of uſe to them. I knew one Mr. *Kingſmill*, who us'd to ſwallow for many Years (if I remember right) Nine at a time once every Day, without any injury; they were near as large as Walnuts, roundiſh, and ſmooth, and he found they always paſſed: But afterwards he dy'd ſuddenly.

Remarks on it; by Dr. Sloan. Ib. p. 192.

XVII. Sir *Fran. Butler*'s Lady being ſurpriz'd with a large and painful Tumour of the *Umbilicus*, Conſulted Dr. *Eeles* and Mr. *Knowles* about it. After ſome time it broke of it ſelf, and diſcharg'd a great quantity of Prune-ſtones; and notwithſtanding all the Care could be taken of it, ſhe dy'd in about 20 Days.

Prunes-Stones breaking out at the Navel; by Mr. Greenhill. n. 265. p. 617.

XVIII. A Servant to Sir *Anthony Keck* complain'd of a Pain and Hardneſs of his Right Side, which had continu'd more or leſs for 12 Years, and was obſerv'd to approach daily nearer the Skin. I made an Inciſion and pluck'd out a ruſty broken Needle with my *Forceps*, which he thought he might have formerly ſwallow'd. It ſtuck in a manner ſo firm in the Fleſh as if it had been fix'd in Wood, ſo that it could not be extracted without ſome Violence and a ſmall *Hæmorrhage*.

A Ruſty-Needle breaking out at the Side; by Mr. Greenhill. Ib.

XIX. The *Glandulæ Miliares* of the *Small-Guts*, which may alſo in ſome Animals be well call'd *Fragi-formes*, from the Figure of the one half of a Strawberry, I take to be *Excretive Glanduls*, becauſe *Conglomerate*.

The Glandulæ Miliares; by Dr. M. Liſter. n. 95. p. 6062.

XX. *Aug.* 19. 1684. Mr. *Muſgrave* took notice, in the *Stomach* of a Jack, of a large Bed of *Glands*, making about $\frac{1}{8}$ of the inſide of the *Stomach*, and ſeated near the *Pylorus*. The whole Bed appears of a Browniſh Red Colour, and is divided into ſeveral Ridges, which run parallel to one another, and the ſame way with the *Stomach*: for the better Contraction of that Part, eſpecially

A Bed of Glands in the Stomach of a Jack; by Mr. Muſgrave. n. 162. p. 699.

especially when empty; (at which time these *Glands*, being fix'd to the inmost Coat, are, together with it, drawn up into Wrinkles:) that Edge of this Bed of *Glands*, which is nearest the Head of the Fish, is dented, the Ridges breaking off on a sudden; but at the other end, a little on this side the *Pylorus*, they diminish almost insensibly. By these *Glands* he supposes at least a considerable share of the *Menstruum* (the great Efficacy of which makes this Fish a fit Subject to illustrate the Nature of *Digestion*) is separated from the Blood; for Blood-Vessels may be seen, in great Numbers, on the other side of the *Glands*, and inner *Tunic*, by separating it and them from the Middle and Musculose *Tunic*: And, as a farther Argument of this use of these *Glands*, he has observ'd, that that part of the *Stomach*, where they are, is generally Moister than the other part near the Mouth; and that in Dissecting Jacks whose *Stomachs* have been fill'd with some large Fish of the Pinnaceous Kind (which must enter with the Head foremost) the Head and fore-most parts of the devour'd Fish have, as far as the *Glands* reach, been either actually dissolv'd or fairly turning into a Mucilage; whereas at the same time the other, and less Bony part, of the included Fish, being not yet come within the power of the *Menstruum*, has still retain'd its Form and Consistence.

Explication of the Figures.

Fig. 13. *Figure* 13. Represents the inside of the *Stomach* of a Jack which was one Foot and 8 Inches long; the *Stomach* it self, about $8\frac{1}{2}$ Inches. *A A A A*, The Bed of *Glands*. *B B B B*, That part of the inward *Tunic*, which reaches from the Bed of *Glands* to the Mouth of the Fish: It appears much whiter than the *Glands*; the Fibres run the same way with the *Stomach*. *C*. The entrance into the Passage which leads to the *Bladder* of Air. *D*, The *Pylorus*. *E*, The Hollow of the *Stomach* continu'd beyond the *Pylorus*.

Fig. 14. *Figure* 14. Represents the other side of the Bed of *Glands*, separated together with the inner from the middle *Tunic*, and great number of *Capillary* Vessels belonging to the *Glands*, but broken off in Separation.

Experiments concerning Digestion; *by Mr.* Ch. Leigh. *n.* 162. *p.* 694.

XXI. 1. I here give you an Account of an *Artificial Digester*, which I hope may something illustrate the Natural One. The Taste of it is like Meat Vomited out of a full *Stomach*, something Sour, but will not Ferment with an *Alkali*. It is prepared from *Spirit* of *Sulphur*, *Spirit* of *Harts-Horn*, the *Chyle* of a Dog, and the *Saliva*; It is Pellucid, and without any Smell; the *Salt* that it shoots into is *Cubical*. Upon Veal it afforded these *Phænomena*; Into a *Dram* of this Liquor I put a piece of Veal about the bigness of a Nut, and set it upon a Digesting Furnace: In two Hours time there came from the Meat a Liquor that had the Colour and Taste of *Chyle*, and the Meat afterwards was Lighter, Dry, and Insipid. And it afforded the same *Phænomena* also in Beef, Mutton, or any other Meat that I could meet with. From these Observations we may reasonably Conjecture, That by some such *Menstruum* the Meat is *Digested* in the *Stomach*.

I would not here be thought to affirm, That by a *Liquid Menſtruum* alone the Meats are *Digeſted*, but that there are likewiſe requir'd theſe further requiſites, in ſome, or in moſt Creatures. 1. That the *Stomach* receive a gentle Heat from the *Liver*. 2. That the *Stomach* have a Natural Situation. 3. That it be aſſiſted by the *Omentum*. This may be argu'd from thoſe Creatures which have no *Caul*, helping *Concoction* by doubling their Hinder-Legs, and reſting their Bellies upon them, as *Hares* and *Conies*. 4. That the *Stomach* have a *Tunica Villoſa*; 1. Becauſe that by that it is enabled to divide the Meat into Parcels, which undoubtedly muſt much facilitate the Operation of the Natural Ferment. 2. If it had not a *Tunica Villoſa*, the *Tunica Carnoſa* would be apt to be too much diſtended by our Meat and Drink, which would neceſſarily weaken the Tonical Motion of the *Stomach*. 5. That there be *Windings* of the *Inteſtines*; for if it were not for theſe, the *Digeſted* Meat would move too faſt from the *Stomach*, and ſo Torment us with perpetual Hunger.

The *Ingredients* of the *Natural Ferment* I take to be theſe. The *Saliva*, the *Succus* of the *Glands* of the *Stomach*, and a *Nitro-Aerial Spirit* of the *Nerves*. That the *Saliva* is an Ingredient, may ſeem probable from theſe Reaſons. 1. Becauſe that by the help of this, Meats tho' impregnated with different Principles may be made to mix with a *Menſtruum*. 2. Since the *Saliva* is impregnated with a Volatile Salt, it is probable, that that too may help *Digeſtion*. The ſecond *Ingredient*, I take to be a Liquor that is ſeparated by the *Glands* in the Bottom of the *Stomach*: For, beſides the Authority of the Famous *Willis*, and *Sylvius de le Boe*, it is obſerv'd that thoſe Creatures which have the moſt of theſe *Glands* are the moſt Voracious. Laſtly, That the *Nitro-Aerial Spirits* of the *Nerves* are an *Ingredient* of the Stomachical Ferment, ſeems reaſonable from the Arguments of Dr. *Mayow*, who Argues thus: *Jam vero cum Spiritus Animales è Particulis* Nitro-aereis *conſtant, haud difficile erit intellectu quomodo Effectus prædicti ab iiſdem in* Ventriculo *perficiuntur. Quanquam enim Spiritus* Nitro-aereus Acidus *non eſt, ab eodem tamen Ferrum corroditur*, Vitriola *perficiantur*, *Salia* Fixa *ad Fluorem perducuntur*, *Rerumque Compages tanquam ab* Univerſali Menſtruo *ſolvuntur*.

Pharm. Ration. p. 6.

Sylv. de le Boe. p. 881.

Mayow. *p.* 55.

2. *Aug.* 19. 1684. Part of a Mucous Subſtance taken out of the *Stomach* of a Jack, near the *Pylorus*, and mixt with *Solution* of *Sublimate*, became much Whiter than it was before. Another part of it, mixt with *Syrup* of *Violets*, turn'd Green.

By Mr. Muſgrave. *n.* 162. *p.* 699.

The like Effects were obſerv'd by mixing a Liquor, found in the *Stomach* of a Hedg-hog, with *Syrup* of *Violets*, and with *Solution* of *Sublimate*.

Theſe Experiments may be urg'd as an Argument againſt the Exiſtence of an *Acid Ferment* in the *Stomach*: It ſeems probable, that the great Work of *Digeſtion* proceeds from a *Volatile Alkali*.

XXII. It has been the Opinion of ſome Phyſitians, That the *Concoction* of the Food is a kind of *Elixation*, and that the Groſſer and more Solid Parts being as it were Boil'd in the Liquid by the Heat of the *Stomach*, and the Parts adjacent to it, as the *Liver*, *Spleen*, and *Omentum*, are by a long and

The manner of Concoction; *by Dr.* Clopton Havers. *n.* 254. *p.* 233.

and continu'd *Elixation* firſt render'd more Tender, and then Colliquated and diſſolv'd into minuter Particles, ſo as to mix more equally with the Fluid, and with that to make one Pulpament, or *Chylous Maſs*. Others have ſuppos'd it to be perform'd by *Attrition*, as if the *Stomach*, by thoſe repeated Motions which are the neceſſary Effects of Reſpiration, when it is diſtended by the Aliment did both rub or grind off ſome Minuter Particles from the Groſſer parts, and by continually Agitating the Maſs of Food make thoſe parts, which are not Contiguous to the *Stomach*, ſtrike one againſt another, and break one another in pieces, untill they are all Attenuated. Others think that the *Bilious Juice*, others that the *Spirits*, are chiefly concern'd in this *Affair*. Others there are that will have the Food *Diſſolv'd* by a *Menſtruum*, which is ſupply'd from the *Glands* of the *Stomach*, or ſome other way: but theſe differ in their Notions of the Nature of the *Menſtruum*; For there are ſome that ſuppoſe it to be an *Acid*, which does Erode the Groſſer parts of the Food, and Diſſolves them in the ſame manner as *Vinegar*, *Spirit* of *Vitriol*, or any ſuch like *Acid*, will diſſolve even ſo ſolid a Body as Iron. And it cannot be deny'd, but that *Oyl* of *Vitriol* will diſſolve Fleſh-meat, and reduce it to a Pulp. But it is not to be ſuppos'd, that the Fibres of the *Stomach* can admit any ſuch ſtrong and corroding *Acid*, without ſomething to correct it, but it muſt be injur'd in its Tone, and Labour under great and extraordinary Pains. Neither does ſuch a *Menſtruum*, tho' it will Digeſt ſome things, ſeem capable of Diſſolving ſo great a Variety of things as we eat, eſpecially when a great many of them are of a contrary Nature. Some will have the *Menſtruum* to be a *Nitro-Aereous Spirit*, that is Quick, and very Penetrating, and included in its proper Vehicle; which, being in its own Nature apt to Penetrate the Maſs of the Aliment, does diffuſe it ſelf through the whole, and breaking the Vinculum of the more ſolid parts, does Diſſolve their Compages. By others it is thought to be ſome *Saline-Juice* in the *Stomach*, by which the parts of the Aliment are Divided and Diſſolv'd, and thoſe which are fit for Nouriſhment are Volatiliz'd. Laſtly, There are ſome who ſuppoſe the *Digeſtion* of the Food to be perform'd by the benefit of a *Ferment*, which, when it is mix'd with the Aliment, excites in the Maſs an Inteſtine Motion, and the different and contrary Motions or Tendency of the parts, making ſome kind of Colliſion, gradually break off Particles from the Groſſer and more Solid parts, till they are ſo Attenuated as to be apt to mix more equally with the Fluid, and with them to make one Soft, or *Chylous* Subſtance. But theſe alſo differ in their Opinion of this *Ferment*: For ſome think it to be the *Remains* of the *Food* that was laſt *Digeſted*, which having lain ſome time in the *Stomach*, after the reſt is carried down into the *Inteſtines*, contracts an *Acid* or ſome other Quality, and is ſo altered as to partake of the Nature of a *Leaven*. And this *Leaven* being a part of the Food, which has been already *Digeſted*, is ſo Soft and Liquid as to be capable of mixing with the Aliment which is next taken into the *Stomach*, and being Agitated with it by the repeated Preſſures of the *Diaphragm*, *Liver*, and *Abdominal Muſcles*, upon the *Stomach* in Reſpiration, does diffuſe it ſelf

through

through the whole Mass, and being mix'd with it like *Leaven*, or Yeast added to new Wort, *&c.* puts it into a state of *Fermentation*, and by this *Fermentation*, or the Expansion of the *Ferment*, and the more Tenuious parts, which are first put into Motion by it, those which are more solid, and with which they are intermix'd, are Rent and Divided, and so Attenuated as to become a Soft and Pulpous Matter. And although the greatest part of the Food, that is thus broken and Concocted, is by the Contraction of the Fibres of the *Stomach* pressed into the *Duodenum*, yet they do not contract themselves so as to force out all the Aliment, but leave between the *Rugæ* or Folds on the inside of the *Stomach*, a sufficient Quantity to be a *Leaven* to the next Meal; and so from time to time. Some have a Notion, That this *Ferment*, or Principle of *Fermentation*, is in the Aliment it self; which being a Congeries of Matter, consisting of various parts of a different Nature, is no sooner inclos'd in the *Stomach*, and Digested in the Heat of that and the adjacent parts, but the more Spirituous and Subtile particles are put into Motion, both from that Warmth and the difference of their Natures, and enter upon a *Fermentation*: and so by their Intestine Commotion, and the Violence they offer to those parts which oppose the Tendency of any of them, they break and Dissolve what is more Solid. Again, some suppose, That this *Ferment* is supply'd from the *Glands* of the *Stomach*. And Lastly, Others, and perhaps with much better Reason, contend for the *Saliva*, and make that to be the *Ferment* which serves principally for the *Digestion* of the Food; which in *Mastication* being mix'd with our Aliment, is with that carry'd down into the *Stomach*, where the parts of it being put into Motion by a kindly and agreeable Heat, they do *Ferment* with, and Exagitate first those parts of the Food which are most apt to *Ferment* with it, then both conspire to break and Dissolve the Grosser and more Stubborn parts.

But according to my *Hypothesis*, *Concoction* is perform'd after this manner: In order to the more easy and effectual *Digestion* of the Food, Nature has appointed some Parts for the Breaking our Aliment, and reducing whatever is gross into smaller parts, before it is put upon *Digestion*: Others to supply the *Ferment* by which it is to be Dissolv'd and Concocted, and which before it comes to be included in the *Stomach*, does Moisten, and make it more Soft, that it may more easily be penetrated and broken by those Parts which serve to divide every Morsel into smaller pieces, and prevents the Inconvenience and trouble which would arise from the Nourishment sticking about or between them when it is Dry or Viscous.

For the Breaking of that part of our Food, which is not Liquid, Nature has furnisht us with *Teeth*, and those of two Sorts: For some are ordain'd to Divide and Break off smaller Morsels from a larger Mass; others are made for the Grinding those Morsels into much smaller parts. The *Teeth* which serve to Break off pieces of a convenient Magnitude from a larger Mass, are of two Sorts, accommodated to the Nature of the Substance which we eat. These are the *Incisores*, and the *Dentes Canini*. If the

Subſtance which we have to Eat be not Hard, but more eaſily Penetrated and divided, then the *Inciſores* are capable of making an Impreſſion upon it, and fix'd firmly enough in the *Jaw* to Break off that part which they take hold of. But if it be more Solid, and not eaſily Penetrated, nor any piece without Difficulty to be ſeparated from that Body whereof it is a part, then we apply the *Dentes Canini*, or *Eye-Teeth*, to it, which are not ſpread, nor have ſuch an Edge as the *Inciſores*, but are ſharp and pointed like an Awl, and ſo do more readily Penetrate a Subſtance that is Hard, and which the *Inciſores* can ſcarcely make any Impreſſion upon. And as the parts of a more Solid Body are commonly with more difficulty ſeparated, and there muſt be a greater ſtreſs put upon thoſe *Teeth* which Pull it into pieces; ſo theſe *Teeth* are much more firmly fix'd in the *Jaws* than the *Inciſores*, tho' they have but one ſingle Root. Beſides, the Poſition of all theſe *Teeth* is accommodated to their Uſe, as being planted oppoſite to the Aperture of the Mouth, ſo that they may be conveniently apply'd to the Subſtance which we have to Eat before it is Broken, and when it is too large to be admitted within the Mouth. The *Teeth* which do by a Compreſſion and Attrition reduce the little Morſels to ſmaller parts, are from the manner in which they Break the Aliment, call'd *Dentes Molares*, becauſe they do, like ſo many little Mill-ſtones, Grind the Food between them. And that they might be render'd fit for this purpoſe, they are made Broad at that Extremity which ſtands out of the *Gums*, by which means they retain ſome quantity of the Food between them every time the *Lower-Jaw* is pull'd up and forc'd againſt the *Maxilla Superior*. And as they are Broad, ſo they are form'd with Inequalities, and Protuberances, and by the Motion of the *Lower-Jaw*, from one ſide towards the other, they Grind what they have between them into pieces. The Poſition of theſe *Teeth* too is as convenient as that of the *Inciſores*, and the *Dentes Canini*: For being deſign'd to Break thoſe pieces of our Solid Food which are taken into the Mouth, and theſe pieces when they are Compreſſed and moved by the *Dentes Molares* being apt to fly out of the Mouth if there were no Contrivance to prevent it, they are placed beyond the Aperture of the Mouth, and oppoſite to the Cheeks, which keep the Food within that Cavity; and not only ſo, but Preſs it in between the *Dentes Molares* on one ſide, as the Tongue does on the other, untill they have ſufficiently Broken and Divided it.

At the ſame time, whilſt the *Dentes Molares* are Breaking the Food, there flows into the Mouth a *Salival-Juice* which mixes with it, and not only ſerves to Moiſten it, and to render it more apt and eaſy to be Divided, but ſeems to be the *Ferment*, by the benefit of which the Food is Diſſolved and *Digeſted*: And therefore it is intimately mix'd with it by the *Teeth* agitating or ſtirring them together in *Maſtication*. This Liquor, which we commonly call the *Saliva*, or Spittle, ſeems to be a Compoſition made of two ſeveral Juices, very different in their Nature. And therefore the ſeveral parts of it are ſeparated by their proper *Glands*, and Nature has planted no fewer than 4 Pair about the Mouth, which ſupply the Juices that make the *Saliva*; to wit, the *Parotides*;

tides, and the *Glandulæ Nuckianæ*, the *Glandulæ Maxillares Internæ*, and *Sublinguales*. Of these two *Juices*, I think one to be an *Acid*, the other an *Oleaginous Liquor* something like *Oyl* of *Turpentine*. For amongst many Experiments this gave me most Satisfaction, I took a piece of Raw Flesh, and having cut it into pieces, but much larger than what our more Solid Food is reduc'd too by due *Mastication*, I mix'd some Crums of Bread with it, then I pour'd in *Oyl* of *Turpentine* to them, and upon that *Oyl* of *Vitriol*, and having shaked them together, I Digested them about 4 Hours in *Balneo Mariæ*, and then shaking them again in the Glass, I found the Meat Dissolv'd, and they all became a thickish Pulp. I could not but take notice, that *Oyl* of *Camphire* (tho' it does not otherwise seem much different in its Nature from *Oyl* of *Turpentine*) and *Oyl* of *Vitriol*, which upon Mixture will produce an Effervescence as well as the *Oyl* of *Turpentine* and *Oyl* of *Vitriol*, yet did not touch the Meat upon which I pour'd them, so as in the least to Dissolve them. I cannot deny, but that an *Acid* and a Solution of *Salt* of *Tartar* did Dissolve some part of the Flesh Meat, which I mix'd them with, but yet neither so soon nor so perfectly as the two fore-mention'd *Oyls*. And I do the rather think one of those *Juices*, which constitute the *Saliva*, to be of the Nature of *Oyl* of *Turpentine* than of *Fixt Salt*, because it will correct and temper even *Oyl* of *Vitriol*, so as to render it more tolerable to the Fibres of the *Stomach*. Not that I suppose the *Acid* part of the *Saliva* to come near to the Acidity of *Oyl* of *Vitriol*: For tho', when they are mix'd, they will make a Liquor that may not be injurious to the *Stomach*, yet the *Acid Juice*, if it were so Corrosive as *Oyl* of *Vitriol*, would certainly be injurious and painful to the *Salivatory Ducts*, which convey it to the Mouth before it is mix'd with the *Oleaginous Liquor*. But I only say, it is an *Acid*, and in some degree Approaches to the Nature of that *Oyl*.

I do also conceive, that 4 of the 8 *Salivatory Glands*, or two Pair of the 4, do supply one of these *Juices*, and the other 4 *Glands*, the other. And this seems to be a very good reason, why they are so planted, and the Orifice of their *Ducts* so ordered, that the *Juice* which is supply'd by one *Gland*, is discharg'd into the Mouth very near to the Orifice by which the Juice of a different Nature is transmitted from another, so that they must necessarily meet and Mix together. Thus the *Glandulæ Nuckianæ* and the *Parotides* throw in two different Juices by Orifices which open into the Mouth very near to one another, and the *Glandulæ Maxillares Internæ* and *Sublinguales* do below supply the same kind of Juices by Orifices, that open so near to one another as to secure the Mixture of the two different Juices. These *Glands*, I say, do between them afford two divers sorts of Liquors, of such a Nature as are apt to *Ferment* upon their first Mixture, but perhaps more considerably when they come to be Digested by the Heat of the *Stomach*. So that the Colluctation, or *Fermentation*, which Attenuates and Concocts the Food in the *Stomach*, does not ordinarily arise between the *Aliment* and the *Saliva*, but between the several parts of the *Saliva* it self. And indeed if the *Saliva* did not consist of two Juices whose Nature is in such a manner different, as to render them apt to *Ferment* upon their Mixture,

it would be very hard to conceive how it ſhould ſo readily and indifferently ſerve for the *Digeſtion* of all Eatables; how it ſhould Ferment with, and Diſſolve ſo great a variety of things, not only of a Different, but of a Contrary Nature; how it ſhould Ferment with *Acids* as well as *Alkalies*; Digeſt things that are Cold as well as Hot or Temperate; ſome things that are Salt, others that are Inſipid; Bitter, and Sweet; Mucilaginous, Oily, *&c.* But if we ſuppoſe that the *Fermentation* which ſerves for the Digeſtion of the Food, ariſes from a peculiar difference in the Nature of two Juices which conſtitute the *Saliva*, it will be eaſy to give a rational account of our *Concoction* of innumerable things of a different Nature. And this ſeems to be as effectual, and a more certain way to Attenuate and Diſſolve the Groſſer parts of our Food, than if the *Fermentation* were made only between the *Saliva* and the *Aliment*: beſides the *Saliva* ſeems to diſcover a *Fermentation* upon the Mixture of its conſtituent Juices, even at thoſe times when we do not actually Eat; for it is always attended with Bubbles, and a Froth, when it has not been at all agitated in the Mouth, and many of thoſe Bubbles will remain for ſome conſiderable time after we have ſpit it out.

Nature therefore having appointed the *Saliva* for the *Digeſtion* of the Food, has taken care that it ſhall be thrown in upon the *Aliment* on every ſide. Thus the *Glandulæ Nuckianæ* and the *Parotides* ſupply their Juices to that part of the Food which lies on the outſide of the Gums, between the Cheeks and the Teeth, and the *Glandulæ Maxillares Internæ* and *Sublinguales* do beſtow their Liquor upon the Meat which is within the Teeth and Gums. She hath alſo had a regard to the Mixture of the two different Juices of the *Saliva*, which is neceſſary to its *Fermentation*: And therefore, as I have already obſerv'd, the Orifices of the *Ducts* which belong to one ſort of *Glands*, are placed near the Aperture of a *Duct* which conveys a Juice from one of the other *Glands*. So the *Ducts* of the *Glandulæ Nuckianæ* and the *Ductus Stenoniani* do on each ſide open into the Mouth near one another; and the *Salivatory Ducts* of the *Glandulæ Sublinguales* and the *Maxillares Internæ*, tho' they have diſtinct Orifices, empty themſelves under the ſame *Papillæ*; and the Juices, which are ſupply'd by them, Meet there and Flow into the Mouth together. The *Saliva* being thus Mixt, and beginning a *Fermentation*, does partly as it is agitated with the Food by the Teeth and ſome other parts of the Mouth, partly by its own Fluidity, inſinuate its ſelf into, and mixes with the Food, and not only Moiſtens and Softens it, but excites the *Fermentation* which is to Diſſolve it. And when the *Aliment* is thus mixed with the *Saliva*, which ſerves to *Ferment* the whole Maſs, it is then convey'd into the *Stomach*, that great Digeſtive Veſſel of the Body, where it is kept in a *Digeſtive Heat*, and the *Fermentation* not only Continu'd but Improv'd. This *Fermentation* in the *Stomach* firſt Agitates the more Tenuious or Subtile parts of the Food, and puts them into Motion, and ſo with the *Fermentation* of its own, and thoſe Alimentary parts which it firſt communicates a Motion to, improv'd by the *Heat* of the *Stomach*, the *Saliva* muſt neceſſarily Act upon the Groſſer parts. For the Inteſtine Motion which is excited in the Maſs, does not give

give the particles which are Fermented the ſame Tendency, but what is ſo various and confus'd that they muſt inevitably ſtrike not only one againſt another, but againſt thoſe which are more groſs, ſo as to Attenuate them, ſometimes by a Colliſion, which ſtrikes off ſmaller particles from the larger parts; ſometimes by a Compreſſion, when the particles, which are in Motion happen to ſtrike directly againſt any Groſſer part on every ſide of it; ſometimes by a kind of Exploſion. For without doubt the *Saliva*, which is Fluid, inſinuates it ſelf into the *Interſtices* of the more Craſs parts of the *Aliment*, and whatever is Agitated or Expanded in thoſe *Interſtices*, requiring a larger ſpace for the freedom of its Motion, and offering a Violence to every thing that oppoſes its Tendency, will, like Gunpowder included in a Shell, force its way out, and tear to pieces that Matter which does endeavour to confine it. Thus the Groſſer parts are Broken and Divided, untill they are at laſt ſo far Attenuated as to mix more equally with the Fluid, and with them to make one Pulp or *Chylous* Maſs. And altho' I do not apprehend how the *Stomach* ſhould by its reciprocal motions, in Inſpiration and Expiration, be able to Break and Attenuate any matter that will not be ſoftned and Diſſolved by agitation in a Liquid, yet it is certain that theſe motions, caus'd by the *Diaphragme* and *Abdominal Muſcles* in Reſpiration, do make thoſe parts which are broken off, as they are Diſſolved, Mix more intimately with the Liquid, as the Meat, which I Digeſted with *Oil* of *Turpentine* and *Oil* of *Vitriol*, did by agitation Mix more equally with the *Oils*, and became a Pulpament.

It is further Probable, that from the Mixture of the two *Juices* of the *Saliva* and their *Fermentation* there reſults ſuch a *Tertium quid* as is apt to Ferment with the *Bile*. And therefore when the *Aliment* has been under the *Fermentation*, excited by the *Saliva*, a ſufficient time, it is then thrown into the *Duodenum*, where it meets with the *Bilious Juice* which Flows into that Inteſtine from the *Liver*, from which a New *Fermentation* ſeems to begin; and the Commotion of the parts of the *Aliment* being ſtill continu'd, does carry on the Buſineſs of *Digeſtion*, untill the Food is perfectly Concocted. Tho' it is probable, that this New *Fermentation* ſerves not only for the more perfect *Digeſtion* of the Food, but likewiſe for the Separation of the *Chyle* from the *Fæculent* parts. And I was Confirm'd in the Opinion, that from this Mixture and *Fermentation* of the two *Juices*, which conſtitute the *Saliva*, there reſults a Matter which is apt to Ferment with the *Bile*, by this Experiment; The *Bile* being generally allow'd to have much of a *Saponary* Nature, I made a Solution of *Soap* in Fair Water, and mix'd it with the *Oyls* of *Turpentine* and *Vitriol* firſt put together, and from their Mixture, I obſerv'd a very eaſy and gentle *Fermentation*, which continu'd for a conſiderable time.

XXIII. 1. It hath been long in my Thoughts and Deſires to have diſcover'd the Actual Paſſage of the *Chyle* into the *Lacteous Veins*; of which yet I never doubted, as I find ſome do at this Day. The Difficulty lies in the certain and unalterable Character of the *Chyle's Whiteneſs*, eſpecially when received

The Colour of the Chyle *in the* Lacteous Veins; *by D. M. Lyſter. n. 95. p. 6060.*

receiv'd into thoſe *Veins*. And yet it is as certain, that in a *Diabetes* the Urine retains all the Qualities of the Liquor Drunk. Alſo in that famous Inſtance of thoſe that eat the Fruit call'd the *Prickle-pear* (if I remember aright,) their Urine hath affrighted the Eater with the Colour of Blood, that is with the not-alter'd Colour of the Juice of the Fruit. In theſe Inſtances at leaſt we cannot doubt but the *Chyle*, even in the *Lacteous Veins*, was qualified according to the Food and Drink.

To effect then ſomething to this purpoſe, we Laced the Skin of the *Abdomen* of a Dog looſly for a Hand's breadth, and then opening it underneath the Stitches, we took out either the *Duodenum*, or any other part of the *Tenuia Inteſtina*. The *Gut* took out we open'd with a very ſmall Orifice, and having ready a Tinged Liquor luke-warm, we Injected it upward and downward: Carefully ſtitching up the *Gut*, and then drawing the Lace, we unlooſed two of the Dog's Feet, laying him on his ſide for what time we thought convenient. The Tinged Liquors we uſed, were good *Barbado's Indigo* diſſolved in fair Water, and Filtrated; alſo Lumps of *Indigo* thruſt down his Throat; good Broath (as they call it) of a Blew Fat; *Indigo* in Milk; *Saffron* in Milk. Again, we try'd in ſome Dogs Fed before-hand, and Injected the Liquors in the very height of the *Chyle*'s Diſtribution; into others yet Faſting, and that for a longer or ſhorter time. The Succeſs was ſo conſtant, that we cannot ſay we ever did find the leaſt diſcolouring of the *Chyle* on the other ſide the *Guts*, that is within the *Lacteous Veins*, but ever *White* and Uniform.

n. 143. *p.* 6.

But the Succeſs of ſome latter Experiments was as follows; I cauſed a Dog to be Fed, and after 4 Hours or thereabouts, having ready by me a clear Tincture of *Indigo* diſſolv'd in fair Water and Filtred, I open'd the *Abdomen*, and making a ſmall Inciſion in the *Jejunum* I Injected an Ounce or two. This done, we Stitch'd up the *Gut* and all again, and the Dog turn'd upon his Legs. After one Hour and a quarter we cut the Stitches, and then beheld a copious Diſtribution of *Chyle* and Turgid *Lacteal Veins*; but as *White* as ever. And yet carefully ſearching the *Guts*, we perceiv'd none of the Injected Liquor any where. Another Dog, which was kept Faſting 40 Hours, had a very little Fleſh without Water given him about 5 Hours before the Injection of the Tincture of *Indigo*; which was perform'd after the ſame manner as before; only it was now well Warm'd, and about 12 Ounces thrown up the *Duodenum*, and down the *Ileon*. Here were empty *Guts* and not the leaſt appearance of any *Lacteal Veins* in the *Meſentery*; After full 3 Hours the Stitches were cut again, and carefully examining the *Meſentery* we found many *Lacteal Veins* of an *Azure* Colour, and cutting ſome of the biggeſt of them aſunder, we plainly ſaw a thick *Blewiſh Chyle* to iſſue forth, and to ſpread it ſelf over the tranſparent Membranes of the *Meſentery*. Hence it is moſt evident, that the *Lacteal Veins* receive what they carry from within the Cavity of the *Inteſtines*.

The Lacteals *frequently convey Liquors that are not* White; *by Dr.* Will. Muſgrave. *n.* 166. *p.* 812.

2. I have found Dr. *Liſter*'s Experiment to ſucceed, by Injecting a Pint of a Decoction of Stone Blew, into one of the *Inteſtina Tenuia* of a Dog kept Faſting 36 Hours; which not only claim'd my Aſſent to his Concluſion,

ſion, that a Colour'd Liquor may find admittance into the *Lacteal Veſſels*, but alſo enclined me to an Opinion, that the *Lacteals* frequently convey Liquors which are not *White*. And I am more confirm'd in this Opinion by Experiments of theſe three kinds.

1. I kept 2 Dogs Faſting, one 48 Hours, the other 3 Days, and then opened them; in both a conſiderable Number (above 20 where feweſt) of the *Lacteals* appeared *Pellucid*, like *Lymphaticks*; only not ſo full and Turgid as thoſe under the *Liver* are generally, or as the *Lacteals* themſelves are ſometimes ſeen: I cut ſeveral of them in each Diſſection, and immediately a *Tranſparent* Liquor flowed out of the Orifice.

2. A Dog, which had neither Eaten nor Drunk in 3 Days, was ſuffered to Lap a Quart of common Water; an Hour after which he was open'd, the *Lacteals* ſhew'd themſelves in a great Number (perhaps above 60) all *Limpid*, from the Liquor contain'd in them, as in the former Experiments: Part of the Water was ſuppos'd to be ſtill in the *Stomach* and ſmall *Guts*; for the quantity of Water ſeen there, was far greater than that in the *Primæ viæ* of either of the Dogs kill'd Faſting.

3. Another Dog, after three Days Faſting, had a piece of Fat Meat given him; an Hour and half after which, he lapt about a Quart of common Water, and half an Hour after this, was open'd: I firſt ty'd the *Ductus Thoracicus*; then examin'd the *Lacteals*; which I ſaw in as plentiful a Number, and as full as (perhaps) they were ever ſeen in this Species of Animals; 8 or 10 of them, at the firſt opening of the Dog, appear'd perfectly *White*, very many of a faint diluted *White*; but moſt of them were *Pellucid*, eſpecially at the latter end of the Diſſection; by which time ſeveral, which at firſt were either of a Lively, or of a Fading *White*, were now grown *Tranſparent*. That I might ſatisfy my ſelf as to this Difference in the Colour of theſe Veſſels; I opened the *Inteſtinum Jejunum* and *Ileon* in ſeveral places, and found the Water was got as far as the *Cæcum*; and had carry'd down divers little parcels of the Meat with it; by which means the Liquor ſeen in the *Lacteals*, at the firſt view of them, was either of a Perfect or of a Diluted *White*, or elſe *Pellucid*, according to the Mixture of the Meat with the Water in the *Guts*.

I order'd about 3 Pints of Broath to be given a Dog, which had been kept Faſting 24 Hours; and opening him 4 Hours after this, I obſerv'd the *Lacteals*, beginning at the *Duodenum*, (which with the other ſmall *Guts* and *Stomach* was very much diſtended with the matter of the laſt Meal:) all the *Lacteals* that I ſaw at firſt were of a perfect *White* Colour; ſeveral of which I preſt between my Fingers, drawing them from the Circumference toward the Center of the *Meſentery*, by which means I found, that the *Chyle* contain'd in theſe Veſſels appear'd *White*, when it ran in a ſhallow ſtream as well as when it fill'd the *Lacteals*. Viewing the reſt of theſe Veſſels along toward the *Cæcum* I obſerv'd, that near the middle of the *Inteſtinum Ileon*, they began to be of a more Diluted *White*, and a little farther, they were really *Pellucid*, and as Turgid, to appearance, as thoſe that were *White*; after which turning back again toward the *Stomach*, I ſaw

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the ſame Veſſels (I think) in as great Numbers as at firſt (perhaps above 80) but the Colour of moſt of them was chang'd, for they were all now *Pellucid:* Some 3, or 4, which I at firſt cut aſunder for my better Enquiry into the *White Chyle* contain'd in them at that time, being *Limpid* together with the reſt. The ſame thing ſucceeded in a Dog kept Faſting 2 Days, and then open'd 3 Hours after he had lapt 3 Pints of Milk, part of which was ſeen in the *Stomach* of the Dog: About 15 of the *Lacteals*, ariſing from the *Duodenum*, were *White*; above 100, proceeding from the *Inteſtinum Jejunum*, and *Ileon*, were more or leſs *Tranſparent*; as alſo were thoſe of the *Duodenum* at the latter end of the Operation.

The Experiments of the 1ſt. kind do ſufficiently prove, That the *Lacteals* convey not only *Chyle* (which reſults from *Aliments* lately taken into the *Stomach*, and may be called *Liquor Novitius,*) but alſo another Humour ſeparated (as is moſt probable) from the Blood, and now returning to it again; which (by means of the afore-ſaid Experiments,) may be ſeen purely by it ſelf, without any Mixture of *Chyle* with it. And it ſeems not unreaſonable to derive this *Liquor Refluus*, or at leaſt part of it, from the Hollow of the *Inteſtines*; if we conſider that the *Pancreas*, and *Glandularum Plexus Fragiformes*, (not to mention the *Liver*) do daily diſcharge a Liquor into the *Inteſtines*; which (conſidering that Dogs, after 3 Days Faſting, will, as I have often obſerv'd, have very hard *Fæces* in their *Inteſtina Recta*) we cannot well diſpoſe of any other way, than by ſaying, it re-enters the Blood by the *Lacteals*, and is that very Liquor which conduces to the making ſome of them appear *Tranſparent* after ſo long a Faſt. It ſeems alſo probable from the ſame Experiments, that the *Lacteals* are very ſeldom, or never, all empty at the ſame time; for tho' the *Chyle* flows only in certain Tides, or Flaſhes, *pro ratione Ingeſtorum*, yet the *Liquor Refluus*, running in a more conſtant Stream, does when there is no Flaſh of *Chyle* going in, keep the *Lacteals* from being abſolutely empty. And 'tis further evident, that this *Liquor Refluus* is, in its own Nature, *Tranſparent*, and paſſes ſuch through the *Lacteals*, after long Faſting, when no *Chyle* is mixt with it; which is no inconſiderable Step to the making out of my Propoſition, if we recount how long, and how often, very many Quadrupeds, beſide Men, do Faſt from all ſort of *Aliment*; during which time after the *Chyle* of the laſt Meal, or time of Drinking, is all mixt with the Blood, we may ſuppoſe that this *Pellucid Liquor Refluus*, goes alone into the *Lacteals*.

The Experiments both of the 2d. and 3d. kind, ſeem to intimate that a great part of the *Chyle* it ſelf is, in its Journey thro' the *Lacteals*, altogether *Limpid*. Againſt which it may be Objected, That ſome of the *Lacteals* were in a like manner *Pellucid* in all the Experiments of all the 3 Kinds, and therefore it does not appear but that they may be fill'd with a *Liquor Refluus* in the 2 laſt Caſes, as well as (for certain) they were in the firſt Caſe. To this Objection, beſide what may be Anſwered from the Extraordinary Number, and Fulneſs of the *Limpid Lacteals* in the two laſt kinds of Experiments, comparing theſe Veſſels with thoſe of the ſame

ſort

ſort ſeen in the firſt kind (which comparative Exceſs cannot be imputed to any Cauſe ſo reaſonably, as to the Matter given the Dog sa *little* before the Diſſections of the 2 laſt kinds;) beſides this, I ſay, it may farther be Reply'd, That in all the Inſtances of the 2d. and 3d. Caſes, a conſiderable Quantity of Aliment was taken in by each Dog, not long before his Death; That ſome of this Matter was ſeen in the *Primæ Viæ* of every one of them when dead, (an Argument it was not all Diſtributed;) That there is no way certainly known, by which Liquors are diſcharg'd the *Primæ Viæ*, in this Species of Animals, beſides Vomiting, Siege, and by the *Lacteals*; and that, ſeeing neither of the two former took place, it may not be unreaſonable to ſuppoſe, That part of this Matter was, at each Diſſection, in its way through the *Lacteals* to the Blood, all the Operations being at ſuch Diſtances from the time of the matter's being taken in, at which moſt Liquid Aliments are obſerv'd to ſwell up the *Lacteals*.

If therefore the Liquor, ſeen in the *Pellucid Lacteals* of the 2 laſt kinds of Experiments, did in a great Meaſure (for I by no means exclude the *Liquor Refluus*) conſiſt of the Matter lately taken in before the Dogs were open'd, we may with good Reaſon imagine, that Water drunk on an Empty *Stomach*, (as it was in the 2d. Caſe) by ſeveral other Quadrupeds and Men as well as Dogs, will paſs the *Lacteals*, not under a *White* Colour, but rather *Pellucid*; and theſe Caſes are not uncommon amongſt us; particularly this ſeems to hold true in thoſe, who drink great Quantities of Diuretick Mineral Waters, in the Morning Faſting; of which ſuppoſe any Perſon takes and Evacuates 3 Quarts by Urine, in the Forenoon; and with his Dinner, and in the Afternoon, drinks 3 Pints of Beer, or the like (allowing that all the *Chyle* produced from what he takes in at Dinner, and in the Afternoon, amounts to 2 Quarts, and that theſe 2 Quarts of *Chyle* are perfectly *White*; which in all probability is not true; yet I ſay, according to this favourable Account) 3 Pints of *Pellucid*, for 2 of *White Chyle* will paſs the *Lacteals* in this Perſon, in 24 Hours. And what is here ſaid of Water, is not unlikely to be true (*mutatis mutandis*) of ſeveral other Liquors, as Wine, Beer, *&c.* at leaſt ſo far as that they may not paſs *White* thro' the *Lacteals*, which is ſufficient for my Purpoſe. Again, if this Principle be true, the 3d. kind of theſe Experiments will go yet farther and Argue, That the whole Quantity of *Chyle*, ariſing from ſome ſorts of Meat, and Drink, taken either at, or near, the ſame time; or from ſome ſort of Meats taken alone; is not always *White*: for the *Lacteals* which appear'd perfectly *White* in the ſeveral Inſtances of the 3d. kind, were far inferior in number to thoſe that were *Pellucid* in the ſame Diſſections.

From theſe Premiſſes there appears ſome Reaſon to think, that the *Lacteals* frequently convey Liquors which are not *White*; and that *Chyle* may (not improperly) be divided into 3 ſorts at leaſt, *viz. White*, *Pellucid*, and *Intermediate* to theſe; contrary to the Opinion of thoſe Anatomiſts, who thought it to be always *White*, as that Word is contradiſtinguiſht to *Pellucid*; altho' by *Chyle* they underſtood (as I likewiſe do) the Effects of Drink, as well as Meat, Concocted.

The Distribution of the Chyle; *by Dr.* Lister. *n.* 149. *p.* 242.

XXIV. It seems probable, 1. That in the *Digestion* of Meat in the *Stomach*, there is made a Separation or Solution of *Urinous Salts*, no otherwise than in the rotting of Plants or Animals. 2. That the *Chyle* is highly impregnated with this *Urinous Salt*. 3. That the *Whiteness* of the *Chyle* is from the *Fermentation* it has from its Mixture with *Urinous Salts*, and that if Diluted with fair Water, it is wholly depriv'd of that Colour, the *Fermentation* ceasing. 4. That the Salt *Chyle* is convey'd into the Venal Blood, and with it enters the *Heart*; and it is thence thrown out again *Chyle*, as it comes in, by a continual Pulsation, into the Arteries. 5. That as oft as it enters the *Emulgent* Arteries, it there leaves behind it part of its Salinous Liquor or Urine, and consequently abates of its Colour. 6. That when sufficiently freed of its *Urinous Salt*, it becomes a *Lympha*; which we think nothing else, but the residue of the *Chyle*, not yet made into the Nature of Blood, as not sufficiently depurated of its Saline Particles. 7. That probably it Circulates long under the Nature of a *Lympha*, often visiting all the parts of the Body by the Arteries, and returning again to the *Heart*, partly by its own Vessels, and partly by the Veins. 8. That in defect of *Chyle* (for we cannot constantly Feed) Nature continually supplies the Mass of Blood with the *Lympha* or Old *Chyle*. 9. That upon every Supply of Fresh *Chyle*, much of the Old stock or *Lympha* is (according to the necessity of Parts) converted into this or that Use, and not till then. 10. That there is ever more *Lympha* in the Mass of Blood, than there is need for the Diluting of it. The Arterial Blood (be the Animal never so much exhausted by Hunger) always parting with some, upon Extravasation and Coagulation. 11. In the Coagulation of Extravasated Blood, there is no Precipitation of parts, as in Curdled Milk, *&c.* for if the *Chyle* be freshly distributed into the Mass of Blood, it will again separate it self as Oyl will from Water; and in like manner it is with the *Lympha* or Old *Chyle*, neither of them being as yet any Essential part of the Blood. 12. The Venal and Arterial Blood have probably both a like Quantity of *Lympha* to Dilute them; but the Arterial in Coagulating involves within its *Crassamentum* more than the Venal: The Reason may be, for that the Arterial is fuller of Air, which rarifies and renders the Arterial *Crassamentum* more Porous, and Capacious of Lodging the *Lympha*; which yet as it subsides by long standing, parts with more and more *Lympha* daily. 13. The great Instrument of the Circulation of the Blood, is the *Systole* or Vibration of the Heart, which yet would not be sufficient for hindring the Coagulation of the Blood, without a continual Supply of the *Lympha* to Dilute it.

Chylification; *by Mr.* William Cowper. *n.* 220. *p.* 231.

XXV. In the Reception of the Aliment, whose Grossness of parts requires *Mastication*, the *Dentes Incisorii* are for the most part imploy'd to divide it from the more bulky part. When a proportionable piece is thus taken into the Mouth, the Lower-Jaw is variously mov'd by its proper Muscles, and *Mastication* is begun and carry'd on by the Assistance of the *Tongue*, *Cheeks* and *Lips*; the two first still applying the less Divided parts of the Ali-

ment, to the *Dentes Molares*, till there's an equal Commintution of all its parts. At the ſame time divers of the Muſcles, employ'd in the Motion of the Lower-Jaw, are alſo ſerviceable] in haſtening the *Saliva* or Spittle ſeparate dfrom the Blood by the *Parotid Glauds*; thoſe of the Lower-Jaw and under the Tongue into the Mouth, the *Salival Glands* of the Cheeks and Lips alſo contributing their Juices; do all together joyn with the *Maſticated* Aliment, before or at the ſame time it's made fit to be Swallow'd; which Action is call'd *Deglutition*, and is thus perform'd.

The Aliment, as well what's Fluid as that *Maſticated*, being lodg'd on the Tongue, which does ſomewhat hollow it ſelf, by means of its own proper Muſcular Fibres, for the more commodious entertaining the larger Quantity, its Tip and Sides are apply'd to the inſides of all the Teeth of the Upper-Jaw, (and *Gingivæ* or Gums of thoſe who want Teeth) the Tongue is ſuddenly drawn up by the *Muſculi Styloglosſi* and *Mylogloſſus*, together with thoſe Muſcles which pull the *Os Hyoides* upwards; at the ſame time the *Fauces* are alſo drawn up, and their Cavity enlarg'd by the *Muſculi Stylopharyngei*; and about two thirds of the Tongue's ſuperior Surface is adequately apply'd to the Roof of the Mouth; the *Epiglottis*, from its Poſition being conſequently depreſſed, does thereby cover the *Glottis* or *Rimula* of the *Larynx*, and prevents any part of the Aliment from Deſcending into the Wind-pipe. In this part of the Action of *Deglutition*, the *Glands* under the Tongue, and *Excretory Ducts* of thoſe of the Lower-Jaw, are compreſt, and their ſeparated Liquors or Spittle voided by their *Papillæ*, ſituated at the lower part of the *Frænum* or Ligament of the Tongue; and this is done by the *Muſculus Mylo-hyoideus*. When the Aliment is thus forc'd into the *Fauces* or upper part of the *Gula*, at the ſame time the *Gargareon*, together with the *Uvula*, are drawn upwards and backwards by the *Muſculi Sphænoſtaphyli*; by which means any part of the Aliment is hindred from Aſcending into the *Foramina Narium*; aud the *Fauces* by the *Muſculus Pterygopharyngeus* and *Oeſophageus*, are contracted, whereby the Aliment is not only compreſt into the *Gula*, but the Matter ſeparated from the Blood by the *Glands* of the *Fauces*, eſpecially of thoſe large ones call'd *Tonſillæ*, is forced out of their Cells or *Excretory Ducts* to joyn with it in its Deſcent to the Stomach by the *Gula*, through which latter it paſſes, by the Action of it's *Muſcular Fibres*.

Myot. Reform. P. 76.

Myot. Ref p. 88.

The Aliment thus Impregnated with *Saliva* in *Maſtication* and *Deglutition*, being received into the *Stomach*, there, meets with a Juice ſeparated from the Blood by the *Glands* of that Part, whoſe *Excretory Ducts* open into the Cavity of the *Stomach*. By the Commixture of theſe Liquors, whether of *Saliva* or Juice of the *Stomach*, a proper *Menſtruum* is compoſed, by which the parts of the Aliment are ſtill more and more Divided by its inſinuating into their Pores, by which the Air before impriſon'd in their leſs Divided parts, is not only ſet more at Liberty, but by the Natural Heat, it muſt neceſſarily ſuffer ſuch a Rarefaction, as that thereby the whole *Stomach* becomes ſtill more and more Diſtended; Hence it is that we have leſs Appetite ſome time after Eating (when this Intumeſcency is made) than we had imme-

diately after; Hence alſo ariſe thoſe frequent Eructations from divers Aliments, as old Peaſe, Cabbage, and divers other Vegetables, we frequently eat; All which become very much diſturbing in Deprav'd Appetites and Weak Stomachs. At the ſame time when this Intumeſcence and Agitation of the Matter is made in the *Stomach*, the Contents of the Neighbouring *Excretory Ductus's*, namely the *Bile* in the *Gall-Bladder*, and *Liver Ducts*, and *Pancreatick Juice* in the *Ductus Pancreaticus* are compreſſed into the *Inteſtinum Duodenum*, through the Extenſion of the *Stomach* it ſelf; the Refluent Blood of the *Stomach*, at that inſtant, being in ſome Meaſure retarded, whereby the *Muſcular Fibres* are more liable to be Contracted. Nor can we conceive how the Liquor of the *Stomach*, after having joyned with the *Saliva* and Aliment, ſhould be ſtill ſo plentifully Excreted from the *Glands* of that Part, as to Irritate its Internal Membrane, and excite its *Muſcular Fibres* to Contract, ſince the Muſcles of the *Abdomen* would, in like manner as in *Vomitting*, be drawn into a Conſent of Co-operating, and the Aliment would be forcibly rejected by the Mouth: Beſides, ſhould the Liquor of the *Stomach* be ſo diſturbing in *Chylification*, what would it be ſo ſoon as all its Contents were diſcharg'd. The Irritation the *Stomach* undergoes in Hunger, we are firmly perſwaded does not ariſe but through an Accumulation of the *Saliva* in the *Stomach*, in Conjunction with the Liquor of the *Glands* of that Part; Hence it is we rather diſcharge the *Spittle* at that time by the Mouth, than to ſuffer any more of it to deſcend into the *Ventricle*; Hence proceeds what we call the *Watering of the Mouth*; Hence alſo, when the *Saliva* is vitiated, the Appetite is deprav'd. The *Stomach*, by means of its *Muſcular Fibres* Contracting it ſelf, does gradually diſcharge its Contents by the *Pylorus* into the *Duodenum*, in which *Gut*, after a ſmall Semicircular Deſcent, it meets with the *Pancreatick Juice* and *Bile*; both which joyning with it, renders ſome parts of the Aliment more Fluid, by ſtill diſuniting the groſſer parts from the more pure; and here *Chylification* is made perfect.

Myot. Ref. Introd. p. 12.

The *Bile*, which abounds with *Lixivial Salts* and apt to intangle with the groſſer parts of the Concocted Aliment, ſtimulates the *Guts*, and Deterges or Cleanſes their Cavities of the Mucous Matter, ſeparated from the Blood by the *Glands* of the *Guts* and lodged in their Cavities; which not only moiſtens the inſides of the *Guts*, but defends the Mouths of the *Lacteal Veſſels* from being injured by Alien Bodies which often paſs that way. The Contents of the *Inteſtines* moving ſtill on by means of the *Periſtaltick* or Worm-like Motion of the Guts, whilſt thoſe thinner Parts fitted for the Pores of the *Lacteal Veſſels*, call'd *Chyle*, is abſorbed by them; the thicker move ſtill more ſlowly on, and by the many ſtops they continually meet with by the *Connivent Valves*, all the *Chyle* or thinner parts are at length intirely Abſorbed, the Remains being meerly *Excrementitious*, are only fit to be excluded by Stool.

The Analogous *White* appearance of the *Chyle*, whether in the *Stomach*, or *Inteſtines*, and always in the *Venæ Lacteæ* and *Thoracick Duct*, may be ſeen in the Commixtures of divers Liquids, which ſeparated exhibit no ſuch appearance.

Nor

Nor is this *Phænomenon* any otherwiſe than a Tranſpoſition of Particles whether by a *Menſtruum*'s inſinuating into them, Dividing them into Groſs Globules, as an *Acid* into a *Sulphur*, as Vinegar with Oyl, *&c.* or elſe by *Precipitation*, as when a Gummous or Reſinous Body is diſſolved in a Spirituous *Menſtruum*, and mixt with a *Phlegm*; ſo Tincture of *Myrrh* and *Benjamin*, &c. make a Milky Appearance in common Water.

The *Longitudinal* and *Tranſverſe* Orders of Fibres of the *Guts*, are the Inſtruments by which the *Periſtaltick* Motion of them is perform'd, which Motion is not only neceſſary for puſhing their Contents forwards; but by the Reciprocal Contraction of thoſe Muſcular Fibres of the *Guts*, and Appoſition of their *Connivent Valves*, the Mouths of the *Lacteals* are diſpoſed to receive what's fitted for them: Hence it is we can by no means make any Fluid whatever paſs from the Cavity of the *Guts*, into thoſe *Lacteal Veſſels*, in a dead Animal. A farther Uſe of this Contraction of the Muſcular Fibres of the *Inteſtines*, is to Accelerate the *Chyle* in its Progreſs in the *Lacteals*, till the *Lympha* deriv'd from the Extremities of the Arteries of the *Guts* joyns with it, which Conjunction is made in the *Lacteals*, before they leave the External Surface of the *Inteſtines*. By this means the Progreſſion of the *Chyle* is made towards the *Meſenterick Glands*, into whoſe Cells it's received, where it again mixes with a Juice brought in by the Arteries of each *Gland*; which Juice or *Lymphatick Liquor*, not only farther Dilutes the *Chyle*, like that from the Arteries of the *Inteſtines*, but adds a freſh *Impetus*, by which its Motion is farther carried on through the *Vaſa Lactea Secundi generis*, (ariſing out of each *Meſenterick Gland*, and diſcharging their Contents into the *Receptaculum Chyli.*) Here the *Chyle* meets and joyns with the *Lympha* ſent through the *Lymphe-Ducts* from the inferior Limbs and neighbouring Parts, whereby the *Chyle* is not only farther prepared; but its Aſcenſion is promoted in the *Thoracick Ducts*, whoſe ſeveral Diviſions and *Inoſculations* (like the Veins of the *Teſticles*) with its many Valves looking from below upwards, and advantagious Situation between the great Artery and *Vertebræ* of the Back, together with the *Lymphe-Ducts*, diſcharging their *Lympha* deriv'd from the Lungs and neighbouring Parts of the *Thorax*, does demonſtrate the utmoſt Art ſtill uſed in order to its Aſcenſion towards the Left *Subclavian Vein*. Before the *Thoracick-Duct*, thus charged with the *Chyle* and *Lympha*, empties it ſelf into the *Subclavian Vein*, it receives the *Lympha* brought from the Superior Parts, all which joyning are ſoon diſcharg'd into the Left *Subclavian Vein*, where meeting with the Refluent Blood of the Superior Parts, paſſes with it through the Deſcending Trunk of the *Vena Cava*, and joyns with the Refluent Blood of the Inferior Parts, in the Right *Auricle* of the *Heart*, whence it's expell'd by its Contraction into the Right *Ventricle*, when the *Heart* is in *Diaſtole*; but by the *Syſtole* or Contraction of the *Heart*, it's again driven out thence into the *Arteria Pulmonalis*, through whoſe Extremities, in Conjunction with thoſe of the *Vena Pulmonalis*, it paſſes to the Left *Auricle* and *Ventricle* of the *Heart*, from whence 'tis again expell'd in the *Syſtole* (as above) in the *Aorta* or *Arteria Magna*, by whoſe Branches it's convey'd through the whole Field of the Body: The

3 *Tricuſpid Valves* in the Right, and 2 *Mitral Valves* in the Left *Ventricle* of the *Heart* oppoſing its Return into the Veins, and the *Semilunary Valves* of *Arteria Pulmonalis* and *Aorta* preventing its Ingreſs into the *Ventricles* are ſufficient (when rightly conſidered) to Demonſtrate the Neceſſity of a Circulation of this Grand Fluid called *Blood*.

An Ill Digeſtion *by too much Study*; *by* M. Chriſt Kirby. *n.* 96. *p.* 6093.

XXVI. A Miniſter near *Danizick*, about 50 Years Old, being much indiſpoſed, and often relapſing into a Diſtemper accompanied with Vomitting and Purging, his Phyſitian told me, he was perſuaded, that his Cure was obſtructed by the Patient's being oblig'd to Study: For when by the help of the Medicines, preſcrib'd to and us'd by him, he was brought to a conſiderable degree of Recovery, his Studying and Preaching made him conſtantly Relapſe. And to confirm this Conjecture concerning the Spirits being drawn away from the Stomach, and leaving the Digeſtive Power Languid, he added, that the Preacher one Day falling into a Reſapſe after a Sermon preach'd by him, and Vomits coming ſtrongly upon him, he caſt out, amongſt other Matter, ſeveral Pieces, ſome as large as the End of a Man's Finger, ſome leſs, of a Subſtance, to the Touch and Eye perfectly reſembling Tallow; 4 pieces whereof weighed half an Ounce.

Four Men living on Water without Food 24 Days; *by* . . . . . *n.* 158. *p.* 577.

XXVII. Some Colliers, working in a Coal-Pit at *Herſtol*, about half a League from *Leige*, one of them in *Feb.* 168¼. pierc'd a Vein of Water, which guſhing in violently, Drowned one; thoſe that were near the Mouth of the Pit were drawn out; but 4 of them, being further within, ſaved themſelves upon a little Aſcent within the Mine. 24 Days were ſpent in drawing off the Water, and the 25th. they were drawn out: I ſaw and examin'd them my ſelf. They had not a Morſel of Bread with them, but liv'd on the Water of a little Fountain, which broke out by them; 2 Bottles of which I caus'd to be Evaporated, but found nothing but a ſcarce perceptible Calx remaining.

A Ruminating Man; *by Dr.* Fred. Slare. *n.* 193. *p.* 525.

XXVIII. Having heard of a Perſon at *Briſtol* that did Eat his Meat twice, I procur'd the following Account of him, from Mr. *Day*, at that time Mayor of *Briſtol*, in Anſwer to a Set of Queſtions I ſent thither.

He begins to Chew his Meat over again within a Quarter of an Hour after his Meals, if he Drink with it; if not, ſome time longer. This Chewing after a full Meal laſts about an Hour and a half. If he go to Bed preſently after Meals, he cannot ſleep till the uſual time of Chewing be over. The Victuals upon the Return taſte ſomewhat more pleaſant than at firſt. Bread and Meat and Cheeſe and Drink, does ſeem to me to Return much of ſuch Colours as they would be of if they were mix'd together in a Mortar. Liquids, as Broth or Spoon-meat, return to his Mouth all one as Dry and Solid Food. The Victuals lie heavy in the lower part of his Throat, as it ſeems to him, untill it has paſſed the ſecond Chewing; afterwards it paſſes clean away. This he always obſerves, That if he eats of Variety of Things,

that

that which passes down first, comes up first again to be Chewed. If this Faculty leave him it signifies Sickness, and he is never well till it return. He is about 20 Years of Age, and was always thus since he can remember. His Father does so sometimes, and in small Quantities, but nothing like to this. He was formerly bred up in the Mines, but now he is a Day-Labourer, and of tolerable Sense and Reason.

I have known several in *London*, that do not fail to throw up an Ill-Tasted and bitter Mass, half an Hour or an Hour after Feeding, and that to their great Disgust: but in true *Rumination* it returns Pleasant, and they Chew it the second time with Delight.

XXIX. In *May*, or *June* 1700. A Labouring Man of Middle-Age, at *Stanton* (7 Miles from *Bury*) had for many Days together so inordinate an Appetite, that I had it attested to me from an Eye-Witness, that he eat up an ordinary Leg of Veal roasted at a Meal. He would eat Sow Thistles, and divers other Herbs as greedily, during the time his βελιμία lasted, as the Beasts that are wont to use such Food; and all he could get was little enough to satisfy his Hunger. I am told he vòided divers Worms, as long and as big about as an ordinary Tobacco-Pipe. After which his Appetite declin'd by degrees, till it came to be of a common Rate with that of others. He cannot do so good a Day's Work now as he was wont, but has almost recover'd his wonted Strength again.

A Bulimia; by Dr. James Burrough. *n.* 264. *p.* 598.

XXX. A Minister in *Yorkshire* was troubled with a Cough, and other Mischiefs; for Relief against which he took a Journey to *London*, and that, for the most part, on Foot: He liv'd not above a Fortnight after he came up. In his Sickness he was much addicted to drink Brandy, which hasten'd his Death. We observ'd his Limbs to be much macerated, his Belly was Swell'd with some inequality, especially in the Tract of the Right Muscles: A considerable Quantity of Water was taken out of it; his Guts inflam'd, and extended with Wind; his Gall very Viscid; his Lungs inflam'd, and beset with divers *Glandules*. The *Order* of his Bowels were *Inverted*; his *Liver*, which was very large, lay in the Left *Hypochondre*, and his *Spleen* in the Right; the *Cone* of his *Heart* was on the Right side, and accordingly the Larger and Thinner *Ventricle* was found on the Left; and the Thick one, which in others is on the Left side, was in him on the Right. The *Great Artery* Descended on the Right side, and the *Vena Cava* Ascended by his *Liver* on the Left. The *Oesophagus* descended to the first Orifice of the *Stomach* on the Right-side, which made the *Pylorus* and Entrance of the *Pancreas* be on the Left, and the first Flexure of the *Small Guts* to be towards the Right: So that the beginning of the *Colon*, with its *Appendicula*, lay at the Left *Os Ilion*, and the *Flexura Sigmoidæa*, towards the Right. This Inverted Situation of his Bowels had not any evident Influence upon his Diseases and Death. He was about 30 Years of Age, a Married Man, had several Children, was of a Middle Stature, Healthful till toward the latter end of his time: He had no Prominency on his Left side, more than the

The Order of all the Bowels Inverted; by Dr. Hen. Sampson. *n.* 107. *p.* 146.

the other; was not Left-Handed, nor had any Weakneſs on his Left ſide.

The Cæcum of a Bitch cut out; by Dr. Will. Muſgrave. n. 151. p. 324.

XXXI. In *Eaſter-Week* 1683. I cut out the *Cæcum* of a Dog; but 2 Days after the Operation the Dog dy'd. But in *Apr.* 1683 I took a Bitch, of about a Year Old, and open'd the *Abdomen*, on the Right ſide, in the *Regio Iliaca*, paſſing my Knife through the *Muſculus oblique aſcendens*, and by the ſide of the *Muſculus Rectus*; having found the *Cæcum*, I immediately put up the other Guts again into the *Abdomen*, after which I ſeparated the *Cæcum* from the *Ileum*, cutting the Membrane which binds part of the former to the latter; then, having made a Ligature on the Artery which comes to the *Cæcum*, I made 3 or 4 Prick-ſeams thro' the ſides of the *Cæcum*, at the farther end of it, where it is continu'd to the *Rectum*, and by thus ſowing the ſides together, ſtopt the Paſſage of the *Fæces* that way; after this I cut off the *Cæcum* about ¼ of an Inch from the Stitches, and ſowed together the new made Lips. The Wounds being ſow'd up, and the Bitch ty'd away, ſhe lapt a ſmall quantity of Milk the next Morning, and by Degrees recover'd: So that in 3 Weeks ſhe ſeem'd as well as ever; and in a little time grew Fat, and Proud, and brought a Litter of Whelps. In *Sept.* following, I cau'd her to be Hanged, and when I had open'd her we found a great part of the *Omentum* lie in a Heap on the Right ſide; it had not recover'd its Natural Poſture ſince it was put up with the Guts, at the firſt opening; the Edges of the Wound were well grown together, and we did not find any thing that ſeem'd to intimate the leaſt want, or ſupply the place of the *Cæcum*.

The Cæcum dilated with an almoſt Liquid Matter; by M. ....Giles. n. 225. p. 402.

XXXII. *An.* 1689. A Lady, about 64 Years Old, had a hard round *Tumour* in the Lower Region of the *Belly*. They mov'd this Globe in the ſame manner as they do the *Matrix*, when it is big with a Child of 6 or 7 Months Old; no Accidents like a *Fever*, Pain, Vomiting, loſs of Blood, *Fluor Albus*, &c. accompanied this *Tumor*, but a conſtant voiding of Urine. The Phyſicians after much Search and Conſultation agreed, that it was a *Schirrus*; but ſome plac'd it in the *Epiploon*, others in the *Meſentery*, and others faſten'd it to the *Matrix*. In view of this they gave her *Emetiques*, ſtrong *Purgatives*, *Diureticks*; they apply'd *Emollients* and *Reſolvents*: but all to no Purpoſe. But having taken the Air one Day in her Coach, at her return ſhe had an Inclination to go to Stool, and fill'd a Baſon with groſs Excrements, a little black and not very ſtinking: This ſhe did a ſecond time; and found her ſelf immediately reliev'd, her *Swelling* diſappear'd, her Urine ſtopt, and in a few Hours ſhe was perfectly well.

A Year after that, ſhe fell into an *Apoplexy*, out of which ſhe recover'd by Emetiques and Purgations. In 1691. the *Tumor* ſhew'd it ſelf again with the ſame Marks as before; and all poſſible Care was taken to make Nature do again what ſhe had before done with ſo good Succeſs. But tho' the *Purges* and *Clyſters* did very ſtrongly their Office, ſhe was nothing reliev'd; the *Tumor* augmented daily, and two Years after its firſt appearing the Party dy'd.

When

When I had open'd the Body, the *Tumor* appear'd to be nothing elſe than the *Cæcum* dilated; its Membranes were outwardly ſmooth, and of the ſame Colour with the *Inteſtines* without alteration, and full of Veſſels of all ſorts. The *Ileon* laid along the *Tumor*, being flat againſt it, and return'd to joyn the *Colon* as is uſual; ſo the Excrements had the liberty to paſs from the *Ileon* to the *Colon*, without entering into it. I found in this *Tumor* about 3 *Chopins* (or *Quarts*) of Greyiſh Matter, without Smell, and of a Conſiſtence rather Liquid than Thick. The Interior Membranes were very beautiful; and all the parts of the *Swelling*, as well as of the neighbouring Organs, appear'd very ſound.

I could not diſcover any Hole, or Communication, this *Tumor* might have had with the *Ileon*, yet ſome there muſt have been in the beginning by which it diſcharged its groſs Excrements; but after this Evacuation I believe that this Opening was ſtopt, and that the ſides of this great Bag, which had come cloſe together by the going out of this groſs Matter, did by degrees ſtretch and open themſelves to receive this Heterogeneous Stuff, which I found there, produced either by the *Glands* of theſe Parts, or ſome *Lymphatick Veſſels* which I ſaw there, or ſome Fluid Bodies expreſt from the *Chyle*, or other Humours. The Compreſſion which the *Tumor* made on the Bladder, made the Urine run out as faſt as it came in; its *Sphincter* not being able to reſiſt the Violence of this Load.

XXXIII. Mr. *Knowles* being call'd to open a Youth, who dy'd, as was ſuppos'd, of the *Cholick* and *Convolvulus*, found the *Cæcum* vaſtly extended, and ſtuft with abundance of Cherry-Stones, which were the occaſion of his Death.

The Cæcum extended with Cherry-Stones; by Mr. Knowles. n. 265. p. 617.

XXXIV. We have obſerv'd (among many other particulars in the *Guts*) the Uſe of the *Inteſtinum Cæcum* to be ſubſervient to that of the *Colon* and *Rectum*; which is manifeſt in ſuch Animals, where Nature intends a certain and Determinate Figure to the Excrements.

The Uſe of the Inteſtinum Cæcum; by Dr. M. Liſter. n. 95. p. 6062.

I underſtand by Determinate Figure, 1. The Excrements divided into many ſmall parts of a like Shape; ſuch as Sheep, Deer, Conies, Hares, Rats, Mice, Horſes, Caterpillers, ſome Snails, *&c.* do naturally void. 2. In a greater Latitude, I oppoſe Figur'd Excrements to Liquid, as *C. Celſus* in ſome place doth: Thus the Dung of Pigeons, Geeſe, and Men, Cats, Dogs, *&c.* may be ſaid to be Figured. Now the *Cæcum*, in my Opinion, is ſubſervient in ſome meaſure to the Figuration of both, but moſt Manifeſt in the firſt kind. My meaning is, that probably the Uſe of the *Cæcum* is to keep the Excrements, which ſhall paſs into its Cavity (and I believe all, or moſt part of them, do ſo in ſound Animals) ſo long untill they are ſufficiently drain'd, bak'd, harden'd, or of a due Conſiſtence (as Clay is tempered for the Mold) to receive the Figure to be given it from the *Colon* and *Rectum*. This Uſe I ſay of the *Cæcum*, ſeems to me to be much more manifeſt in ſuch Animals, as have Figured Excrements of the firſt kind. In Rats for Example, whoſe Excrements are conſtantly alike Figur'd, the *Cæ-*

n. 155. p. 455.

cum is very large, more Capacious than the Stomach it ſelf. But its Uſe in receiving the Excrements, or exhauſted *Chyle*, is not more apparent, from its large Capacity, than that other of farther drawing and Tempering them to a Stiffneſs, for the Service of the *Colon*, from the admirable Contrivance and Structure of this latter Gut, which is a *Phænomenon* that deſerves further Conſideration: It is, I ſay, to be noted, that immediately under the Valve of that Gut, in this Animal, are certain Spiral Fibres, which make a kind of Screw. Now it ſeems to me, that the Excrements, after they are brought to a due Conſiſtency by the neceſſary Stay they make in the *Cæcum*, and being carried out thence into the Spiral Foldings, or Screw, of the *Colon*, cannot deſcend in a perpendicular, as formerly through the ſmall Guts, but ſtill gently glide, and that very leiſurely by the winding of the Screw; whence ariſes the Figure. And I am apt to believe, that if the *Cæcum* of a Rat, or any of the firſt kind of Animals mention'd, was ty'd up, or otherwiſe hindred from its Receipt, the Animals would unavoidably fall into a *Diarrhæa:* there being, I ſay, no Reaſon, that I can fore-ſee, why the yet Liquid Excrements, or exhauſted *Chyle*, ſuch as we conſtantly find it, even at the very bottom of the *Small Gut*, ſhould ſtop at the entrance of the *Colon*, and not ſpeedily glide through the Screw, in a downright Deſcent; that is, elude the Device of Nature, and make the Configuration of that ſo curiouſly contriv'd Part uſeleſs; we, I ſay, ſuppoſing the Experiment to have taken away the neceſſary *Diverticulum* and Repoſitory of the unprepared Excrements, in tying up the *Cæcum*.

I know not whether the Obſervation will hold good in general Terms, becauſe, I ſay, I have not yet purpoſely examin'd divers Animals in Nature; *viz.* That wherever there are elegantly Figur'd Excrements of the firſt kind, there is ever a Capacious *Cæcum*; and on the contrary, the leſs accurately Figur'd and more Liquid the Excrements of any Animals are, the leſſer the *Cæcum* or none at all. This is certainly true, that ſome Animals which are naturally looſe, have no *Cæcum* at all, or very little, as the *Talpa*, the *Echinus Terreſtris*, the *Gulo*; and amongſt Birds the *Wood-pecker* Kind, the *Hawk* Kind, *&c.*

We forbear to offer ſome Doubts we have, concerning Nature's End in the neceſſary Figuration of the Excrements in ſome Animals; as firſt to prevent *Diarrhæa's*; Secondly to abide Hunger the better, thus Snails in Winter reſt with full Inteſtines; Thirdly and chiefly to heighten the *Fermentation* and *Digeſtion* in the Stomach and Small Guts.

An Infallible Cure of Dyſenteries; *by M.... ... n.* 238. *p.* 69.

XXXV. 1. The Root *Ipecacuanha* is an Infallible Medicine for Curing *Dyſenteries* and Looſeneſſes, how Dangerous and Inveterate ſoever the Diſtemper may be. But I muſt except all ſuch Patients as are Diſeaſed in their *Lungs*, and *Hydropick* Perſons, whoſe Fluxes are Signs of approaching Death; and ſuch as have already *Gangrenes* in their Bowels, which they ſurely diſcover when they are diſorder'd in the Head, have a *Hiccup* and a Vomiting, with a Pain in the Lower Belly, accompanied with Stools reſembling the Dregs of Wine, or the Waſhings of Meat, Smelling like Carrion

rion. As for all others, Sick of a *Dyſentery*, they need but to obſerve the following Rules, and they will be Cured.

For 3 Days together, Morning and Evening, they muſt take one of the Papers of Powder mark'd with *A*, Diluted with half a Glaſs of Wine and as much Water, to diſpoſe them by Degrees for Purging, and to Sweeten and correct the ſharp Corroſive Humours, which are of the Nature of *Aquafortis*, and the *Spirit* of *Nitre*, and which eat away the Tunicles of the *Inteſtines*, and the Mouths of the Veſſels; from whence it comes to paſs, that from a ſingle Looſeneſs they often fall into a *Dyſentery*, becauſe thoſe deprav'd Humours become ſharp and Corroſive, and the Malady augments every Day: ſo that to make a ſure Cure, we muſt begin by deſtroying the Sharpneſs and Malignity of thoſe Humours, which is done by this firſt Remedy.

A. ℞. *Antim. Diaph. Crabs Eyes*, of each *gr.* 10. *Croc. Martis*, *gr.* 8. *Mace*, *gr.* 4. He muſt eat ſmall Broth 2 Hours after, or a Cruſt of Bread dipt in it, or a freſh Egg in faſhion of an Ammulet, and Dine lightly; if they find they have need of Nouriſhment, after Dinner they may eat a Toaſt and Wine and Sugar, or a little Bisket ſteept in Water or Wine. At Night they may take another Paper markt *A*, as before, and Sup lightly.

The *4th.* Day they muſt take the Doſe markt *B*. ℞. Of *good Ipecacuanha*, well pulveris'd, ʒj. with ʒvj. of *Cinamon*, diluted in ſmall Broth, or in half a Glaſs of Wine, to clear the Stomach of a Viſcid Bile, that weakens the Natural Heat, and hinders the Digeſtion of the Food; ſo that the *Chyle* growing ſour, inſtead of growing better, does change all the Maſs of the Blood, and trouble the whole Oeconomy of the Body, which produces all the Accidents which ordinarily accompany this Diſeaſe. They ſhall take, 4 Hours after, ſome Broth, and the remainder of the Day eat ſparingly; the Day after they ſhall take 2 Papers markt *A*, as before.

The *7th.* Day they ſhall take the Medicine markt *C*. ℞. Good *Rubarb*, ℈ij. *Ipecacuanha gr.* xv. Pulveriſe them well, and mix them in a Glaſs of *Ptiſan D*, deſcrib'd hereafter. This Medicine will take away part of the Obſtructions; they ſhall take 2 Hours after, Broth.

The *9th.* Day they ſhall take the Doſe markt *B* 2. ℞. Good *Ipecacuanha* ℈ij. with *Cinamon gr.* vj. well Pulveriſed, and mixt with Broth or Wine.

The *11th.* Day they muſt take a 2d Medicine markt *C*, and obſerve the ſame Regimen as at firſt.

On the *13th.* they muſt take the Doſe markt *B* 3. ℞. Good *Ipecacuanha* ℈j. half a ʒ of *Cinamon*, with vi *gr.* of *Nutmeg*, and obſerve the ſame Diet as on the two others.

On the *15th.* they ſhall take the Doſe markt *B* 4. ℞. Good *Ipecacuanha* ℈j. with *Nutmeg gr.* x. well pulveriſed. They muſt keep themſelves as on the 3 former Days.

Tho' by this time they find themſelves Cur'd, yet they muſt take Care that they ſuffer not Cold in their Feet, nor elſewhere, while the Diſtemper continues; and they muſt yet obſerve as ſtrict a Diet as if they were Sick. They muſt Purge once in 15 Days with the Medicine markt *C*, by which

means they will infallibly prevent a Relapſe, by freeing Nature of the Weight that oppreſſes it.

The 8, 10, 12, Days they ſhall take in the Morning and Evening one of the Packets markt *A*, as before.

If the Sick has no Reſt in the Night-time, becauſe of great Pains, or too frequent Stools, 'tis convenient to take a Spoonful, or one and a half, of the *Syrup* of *Coral*, according to the Violence of the Diſtemper, mixt with a Glaſs of *Ptiſan*. This Syrup will allay the Fermentations, and the Boilings of the Humours, and procure Sleep, which repairing the Force of Nature, will give the Remedies liberty to Act more effectually. We muſt alſo take a Spoonful of that Syrup at the Evening of that Day, in which they have taken the Remedy *B*, or *C*.

All theſe Remedies, markt before, muſt be taken in the Morning Faſting, and two Hours before Supper. Thoſe who do not love to take them mixt with Liquor, may take them in a Wafer, drinking after them. If any of theſe Remedies cauſe Vomiting, as it happens ſometimes, one muſt not be diſcouraged, for he ſhall not fail to be Cured notwithſtanding, becauſe theſe Remedies Act briskly on the Cauſe of the Diſtemper, only he muſt take to drink, after his Vomiting, 3 or 4 Glaſſes of Warm Water, that he may Vomit with leſs Pain.

Children, Delicate Perſons, and Women with Child, ſhall uſe it in the following manner. For Children that are yet under 3 Years Old, they muſt take but the 8th part of the *Doſes* of the Remedies; Children from 3 Years Old to 10, ſhall take a 4th part; from 10 to 15, a third; from 15 to 20, the half. The ſame *Doſe* will ſerve for tender Perſons, and ſuch as are aged, and Women big with Child. As for Robuſt Perſons, from 20 to 60, nothing ſhall be diminiſh'd from the *Doſes* above markt. But all Perſons, who by reaſon of their tender Conſtitution, the weakneſs of their Age, or big Bellies, are forbid the whole *Doſe*, ſhall uſe the Remedies a ſecond time, in the manner I have now preſcrib'd, if the firſt *Doſe* do not Cure them.

In many Occaſions, when the *Dyſentery* is accompany'd with a *Fever*, that the Evacuations of Blood are extraordinary, or the Pains exceſſive, the Patient may be Blooded once or twice, if the Strength of the Patient allow it, to empty the Veſſels, to calm the Pain of the *Fever*, and ſtop the impetuous Motion of the Blood; after which the Remedies may be continued. In this Caſe, I would adviſe to take, before all things, the Packet *B* 4. which before is ordered for the 15th Day; to take away that Fulneſs, which is ſometimes ſo great, that there is Danger in delaying it; after which the Patient ſhall return to the *Doſe* markt for the *firſt* Day, and ſo for the reſt; on the 15*th* the Patient ſhall reſt.

After all theſe Remedies are uſed, the Party ſhall take for 15 Days, a Spoonfull of the *Stomachick Elixir*, pure, or in 4 Spoonfulls of Water; 'tis made after the following Method.

Stomachick Elixir. ℞. Of *Red Saunder*, of *Lignum Aloes*, each half an Ounce; *Cinamon* 2 Ounces; of little *Cardamoms*, *Galangall*, *Cloves*, *Zedoary*, each an Ounce; of *Aniſe-ſeed*, *Fennel*, and *Kermes*, each 2 *Drams*; of *Liquoriſh* 2 Ounces; of

of *Caſhu*, of *Chryſtal Mineral*, of each one Ounce; of *Raiſins* 4 Ounces; *Dates* 10 or 12; cut the *Dates* and the *Raiſins* into little bits, and having beaten that which ought to be beaten, put all into a *Matras*, and pour upon them a Quart of Brandy, in which the *Chryſtal Mineral* ſhall be diſſolved; infuſe them a whole Night, and the next Day add 2 Pounds of *Aqua vitæ*, and let all infuſe in the Cold for 4 Days, ſhaking the Glaſs 4 or 5 times a Day, then Filter the Liquor, and diſſolve a Pound of fine Sugar in the *Elixir*, which is thus compleat.

Its Effect is to fortify the Brain, the Heart, and all the Noble Parts, weaken'd by the Diſſipation of the Spirits; to fortify the Stomach, and correct the Crudities, and diſſipate the Wind and Swellings thereof, which are common Accidents of this Diſtemper.

One muſt, during the Courſe of the Diſeaſe, Eat little, and only ſuch things as are of good Nouriſhment; as Broth made of a piece of Beef, of the bloody end of a piece of Mutton, or a Partridge, or an old Cock, whoſe Bones have been broke, and that without Herbs; inſtead of which one may take 2 or 3 white Onions, with as many Cloves in them, refraining Boiled Meats, when one can have other Nouriſhment, till he feel himſelf perfectly well, becauſe they load the Stomach; and Eat, to Dinner and Supper, Roaſt Meats, tender and Nouriſhing, that are not Larded, Chewing the Meat well before-hand; to Drink at his Repaſts old Wine and Water, and take for his ordinary Drink the *Ptiſan* after-markt. Above all things, the Patient ought to keep himſelf in a quiet Frame of Spirit, that he ſuffer not himſelf to be tranſported by any Violence of Paſſion, the leaſt of which is able to raiſe a new Ebullition of the Blood, and to trouble the Humours.

If the Patient be not Rich, and cannot go to the Expence of theſe Aliments we have mention'd, he may make Broths as he is able, or Milk-Meats, or Food with Water, as it ſhall moſt agree with his Palate, with many freſh Eggs; this ſort of Nouriſhment will cover the Affected Part, and will defend it and preſerve it againſt the Sharpneſs of the Humours.

'Tis very neceſſary for the Diſeaſed to forbear much Drinking, undiſcreetly to quench their Thirſt; for the Heat and Thirſt which they feel, are only Symptoms and Accidents of their Diſtempers, and not the Cauſe; they ought therefore to be more moderate in Drinking than ordinary, ſeeing nothing hurts them more than Exceſs of Drinking, which weakens the Stomach, and ſtifles the Natural Heat. 'Tis therefore convenient only to Gargle the Mouth with Water Sugar'd, or to keep ſome little Verjuice in their Mouths, that may keep them from being Thirſty; but if he Drink, it muſt not be till one Hour after Meals. And ſeeing it may fall out that ſome are Enfeebled and Emaciated by the length of the Diſeaſe, it will be convenient in the Intervals to give them Clyſters made of Broth, which will ſerve to maintain them, and to bring them more quickly to their Strength. After the Uſe of the Remedies, they may, to keep themſelves in a good Habit of Body, take Goat's or Cow's Milk, with a little Chocolate, which we leave to the Judgment of the Phyſitian, putting always to it a little grated Nutmeg, and 4 or 5 Grains of Salt in the Milk, that it may not Curdle ſo ſoon.

For

Ptiſan. For the ordinary *Ptiſan.* ℞. Of *Red Saunders*, the *Rind* of the *Pomegranate*, *a.* ℥ j. *Tormentil Roots*, ℥ß. *Wild Succory* and *Dandelion*, *a.* ℥ ij. choice *Sumach*, ℥ ij. Leaves of *Agrimony*, 2 *pug.* Make all Boil over a clear Fire, in 6 Pints of Water, which ought to be boil'd to one half; at the end of the Decoction, as you take it off the Fire, add to it two *Drachms* of *Cinamon*, and as much Powder of *Liquorice.*

If all theſe things cannot be had, uſe a Decoction of *Dandelion* in *Smith's Water*, with a little *Cinamon.*

If the Pains, which accompany the Flux, continue while he uſes the Remedies that ſerve for Purgation, he ſhall take, as there is need, *Clyſters* made after this manner. ℞. *Shepherd's Purſe* two Handfulls; *Linſeed* ℥ß. *Red Roſes* 2 Drachms, *Salt* a Handfull. Make all Boil in a Decoction of Barley, ſtrain it, and mix with it the Yolk of a freſh Egg, and 2 Ounces of *Honey* of *Roſes.* If the Pains be very violent, one may add two Heads of *White Poppy.* But Care muſt be taken not to miſtake the Pains of the *Guts* for the Pains of the *Fundament*, which may be opened by the *Hæmorrhoids*; to appeaſe theſe Pains one may uſe *Juniper Oyl*, drawn by a Retort in an open Fire, from which the Spirit is ſeparated by the Tunnel. If the *Hæmorrhoids* be Outward, you muſt rub them with this Oyl with a Feather, every 4*th.* Hour; or if they be Internal, one muſt Syringe them with a quarter of a Spoonfull of this Oyl, the Pain will ceaſe in leſs than 2 Hours, and the *Hæmorrhoids* will wither away, without having need of applying any other Medicine. This was communicated to me by *M. Gaſelier*, one of the beſt Artiſts of his time and employ'd by M. *Colbert* for his Surgeon.

Clyſters.

For the Hæmorrhoids.

Some Notes; by Dr. Hans Sloan. *Ib. p.* 78.

2. Altho' I am of Opinion, that the *Root* mention'd in the fore-going Paper, is not ſo infallible a Remedy for *Fluxes* as is pretended; yet conſidering that ſometimes thoſe Diſtempers yield not to ordinary Means, I think it ought to be conſidered of by proper Judges of the Circumſtances of the Sick.

Purchas Pilgr. *Vol.* 4. *Lib.* 7. *Cap.* 1. *Sect* 5.

This Herb ſeems to have been firſt taken notice of by an Anonymous *Portugueze*, who liv'd in *Braſile*, and ſpeaks of an Herb there call'd *Igpecaya*, or *Pigaya*, which I verily believe to be this.

Igpecaya or *Pigaya*, ſays he, is profitable for the *Bloody-Flux*; the *Stalk* is a quarter long, and the *Roots* of another, or more; it hath only 4 or 5 *Leaves*, it Smelleth much whereſoever it is, but the *Smell* is Strong and Terrible; this *Root* beaten, and put in Water all Night at the Dew, and in the Morning, if this Water with the ſame *Root* beaten and ſtrain'd be drunk, only the Water, it cauſeth preſently to *Purge* in ſuch ſort, that the *Laske* ceaſeth altogether.

A Convolvulus, *and an unuſual Rupture of the* Meſentery; *by Dr.* Swammerdam. *n.* 112. *p.* 273.

Fig. 15.

XXXVI. *Fig.* 15. Repreſentat *Convolvulum* ſive *Affectum Iliacum* lethalem, ex Ruptura & Circumvolutione *Meſenterii*, Inteſtina conſtringentis, ortum. *A A*, Inteſtinum *Ileum*, Chylo, Flatu, & Ingeſtis, mirum in modum turgens, atque inflammatum. *B B*, *Meſenterium* Diruptum, conſtituens Vinculum quoddam, Inteſtina funeſto Fato circumligans. *C C*, Notatum Vinculum, ex Rupto *Meſenterio* ortum, ac, Capreoli ferè in modum,

Inteſtina

Inteſtina nectens. *D D*, Vinculum illud ſeorſim delineatum, una cum ejus Capreolo, duabus Circumductionibus conſtans. *E E*, *Convolvulus* Inteſtini, ſeu *Ilei* pars Vinculo fortiter coarctata, ac Sphacelo proxima; à quo Alvus omninò adſtricta fuit, adeo ut tenuium Inteſtinorum Contenta, Vomitu ferè continuo, ſurſum propulſa fuerint. *F*, *Ilei* pars, violentâ illâ ac incomprehenſibili Trajectione Inteſtini per Ligamentum *D D* contra Naturam extenſa, atque Inteſtinum quoddam *Cæcum* mentiens. *G*, *Ilei* extremum, ubi in *Colon* degenerat. *H*, *Colon* modicè contractum, & naturaliter ſe habens. *L*, Inteſtinum *Cæcum*.

The Fæces diſcharged at an Ulcer in the Groin; by Dr. Will. Earnſhaw. *n.* 176. *p.* 1204.

XXXVII. Mulier quædam *Alceſtrenſis* in Agro *Warwicenſi*, annos quaſi quadraginta nata, à vicino Oppido domum rediens, ſubito corripitur Dolore vehementi *Inguinis* Dextri, cui ſucceſſit Singultus violentus: poſt Semihoram *Tumor* ibidem oritur ad quantitatem Nucis *Moſchatæ*, qui ſenſim fit durus, & tandem niger. Mulier Febre & aliis Doloribus adeo vexatur (nullo in Auxillium Medico vocato) ut ſui impos neminem aſtantium cognovit; ita ut precibus publicis Deo commendatur, tanquam jam moritura: Tandem Applicatione neſcio cujus *Cataplaſmatis*, aperitur *Bubo*; à quo aperto quicquid Bibit Editve, immutatum plerumque, intra Horæ quadrantem vel dimidium, exit ſine vel minimo, ſeu in *Ulcere*, ſeu in *Inteſtinis*, Dolore; Ita ut cum die quodam Lac coctum comediſſet, ex *Ulcere* primò Lac ipſum, poſtea coagulatum, cum Crepitu (tanquam ab *Ano*) & Spuma erupit. Tandem Ego vocatus invenio Fæminam *Hecticam*, Emaciatam, Sitibundam, Urinam tamen Sedeſque ſine ullo Dolore ſtatis temporibus deponentem: *Ulcus* 3 vel 4 Digitos longum, latum vero unum, minime profundum, ſed cum Cute pene æquale. Ptiſanam laxantem mitto pro 4 Doſibus; ſed cum Doſis prima ſtatim per *Ulcus* effluxit, nulla Sede per Diem ſequuta, Bolum dedi Purgantem; poſt Semihoram etiam iſtius partem emittit; poſtea tamen Sedes duas, cum multo minore, quam ante, ab *Ulcere* Effluxu. Eundem Bolum Die ſequenti cepit; unde Sedes tres, eaſque amplas, habuit, cum Scybalis multis; *Ulcus* vero parum emittit, totam per Noctem. Exinde Potus exſiccantis, & Traumatici Libras duas vel tres quotidie bibendas, interdum Bolum etiam repetendum ſuadeo; horum Uſu per Dies 14 (ut memini) Sana evaſit.

The Lumbrici Lati *and* Cucurbitini; *by Dr.* M. Liſter. *n.* 95. *p.* 6062.

XXXVIII. 1. We have found in the Guts of a Dog, perhaps more than 100 of the *Lumbrici Lati* or *Tape-Worms*. The *Duodenum* was exceedingly ſtuffed out and extended with them. Which alſo well agrees with another Obſervation I made in a Mouſe, where I found the *Duodenum* to be far bigger than the Stomach it ſelf, by reaſon of the great numbers of theſe Worms, for kind, which were contained in it. For kind, I ſay; for theſe *Tape-Worms* were of a quite different Shape from thoſe of the Dog, or any that I have ever yet ſeen. To proceed, we found them alſo in the Dog's *Jejunum* and *Ileon*, but not any one lower than the *Valvula Coli*, nor any higher than the *Duodenum*, or within the *Pylorus*. Below the *Duodenum* they lay at certain Diſtances one from another, though ſometimes by pairs or

more

more of them twiſted together; near them was conſtantly to be obſerv'd an Excrement of their own, diſtinct for Colour (more Grey) and Conſiſtence from the *Chyle*, (the Obſervation being made in a Dog plentifully fed for other purpoſes) juſt as we find in Worm-eaten tracks of Wood, where the *Coſſi* leave behind them the Wood which hath paſs'd through their Bodies. Theſe *Worms* lay moſtly with the ſmall ends upward, as feeding upon and expecting the *Chyle* in its Deſcent. Theſe *Lumbrici Lati* were none of them above one Foot long, and moſt of them of an equal length and bigneſs. The one end was as broad as my little Finger Nail, and pointed like a Lancet; the other end, coming ſmall gradually for the 3d. part of the whole length of the Animal, was knotted, or ended in a ſmall Button like a Pin-head. They were every where and in all parts of them alike Milk-White, of a flat and thin Subſtance like fine *Tape*, divided into infinite Rings and Inciſures; each Inciſure having ſharp Angles, on both ſides, looking to the broader end, ſtanding out beyond each other: From which alſo I take the ſmall end to be the Head; elſe the ſharp Corners of the *Annuli* would neceſſarily hinder the Aſcent of the Animal; whereas, if the contrary be true, they ſerve to keep it up. Each Ring hath alſo on the one ſide only, and that alternately, one ſmall Protuberance, much like the middle Feet of the Body of ſome Caterpillers. Comparing our Animals with the Cut of *Tulpius*, it was not very eaſy for me to obſerve, becauſe of the great reſemblance, the Specifick Difference of the *Lumbrici Lati* of Men and thoſe of this Animal. I could not diſcover any Motion in any part of them, in Water or out of it, nor did they ſeem, if prick'd, or otherwiſe hurt, much (if at all) to contract themſelves, or ſhorten the *Annuli*: So that they then appeared to me as things without Motion or Senſe.

Medic. Obſerv. l. 2. c. 42.

Ib. p. 6064.

2. There is another ſort of *Lumbrici Lati*, to be met with very frequently alſo in Dogs, call'd *Cucurbitini*, from the likeneſs each *Annulus* or Link hath to a Cucumber-Seed. I have found of them about half a Foot long; but more often broken into ſhorter pieces. The former by us deſcrib'd is undoubtedly a compleat and entire Animal; but there is great Reaſon of Suſpicion, that this is a Chain of many Animals linked together. Theſe Animals, for kind, have been obſerved to have been voided by Men, and found enclos'd in a Gut or Membrane of a prodigious Length. And a Perſon of great Integrity affirm'd to me, That he once aſſiſted at the opening of a Dog, in which one of the Kidneys was obſerv'd to be quite waſted and become a perfect Bladder, and in that Bladder they found ſomething like an Animal of a monſtrous Shape, which being Diſſected was nothing elſe but a Skin full of theſe *Lumbrici Cucurbitini*. Perhaps, the Snakes, Lizards, Beetles, Caterpillers, Toads, and ſuch like things, as we read of in Medicinal Hiſtories to have been Voided, or found in any part of the Body, if carefully examined were nothing elſe but the like Diſguiſes of this ſort of *Worms*, much aſſiſted by the ſurprized Fancies of the firſt Obſervers.

Lumbrici Cucurbitini *found in the Kidneys of a Dog. Ib.*

Plate 1. Vol. 3 Pag. 120.

Fig. 1.

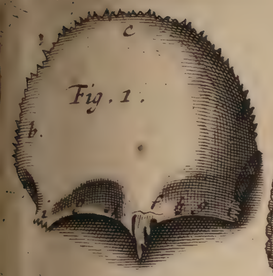


Fig. 3.

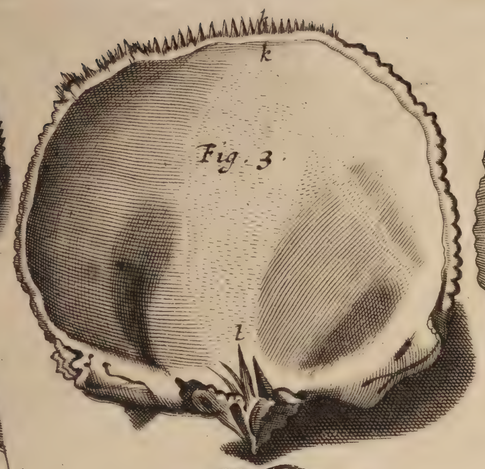
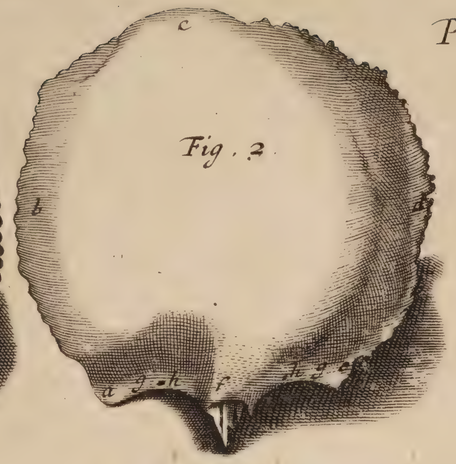


Fig. 2.



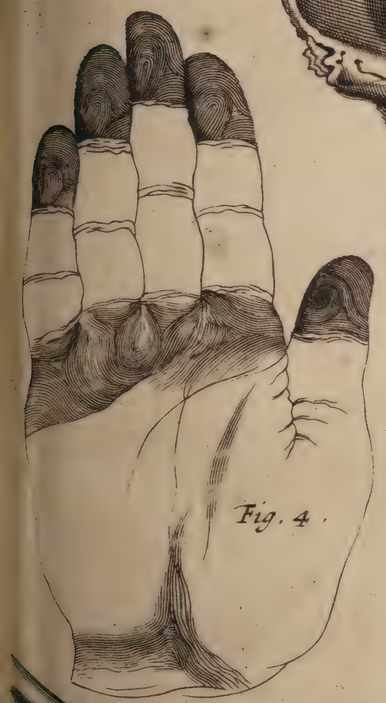


Fig. 4.

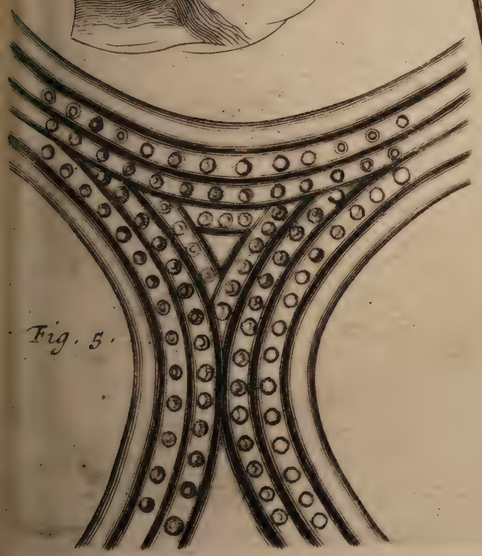


Fig. 5.

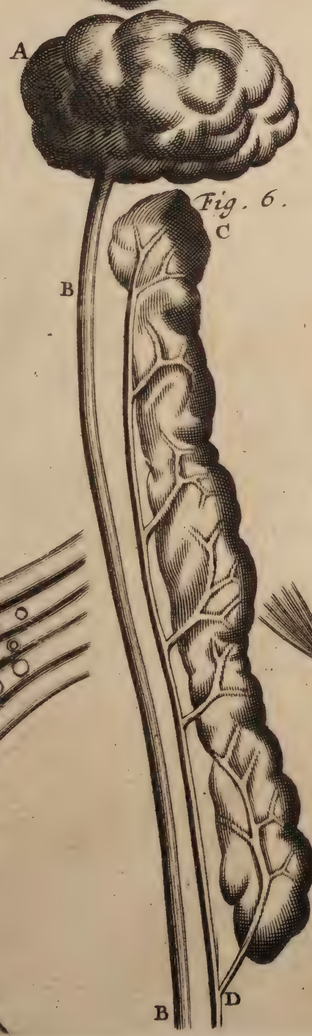


Fig. 6.

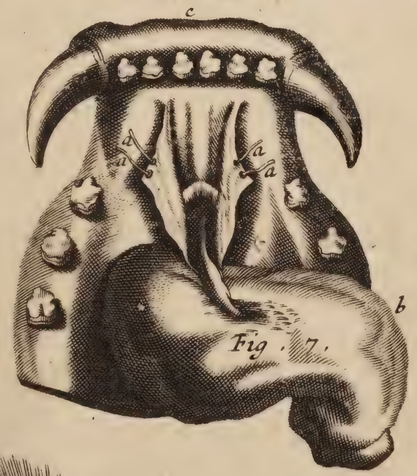


Fig. 7.

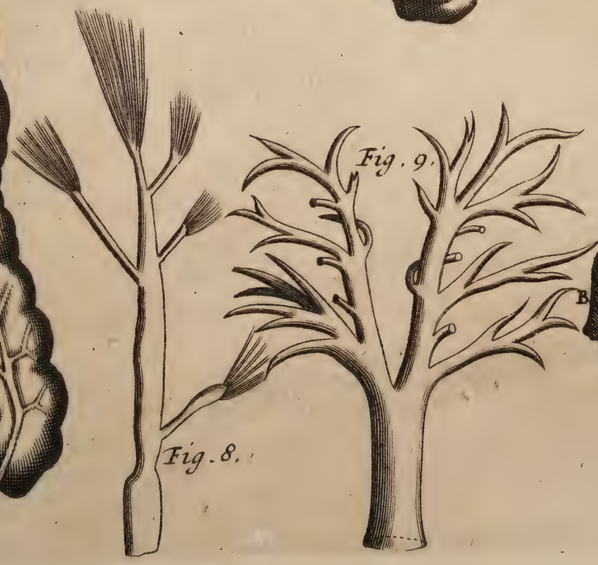


Fig. 8.

Fig. 9.

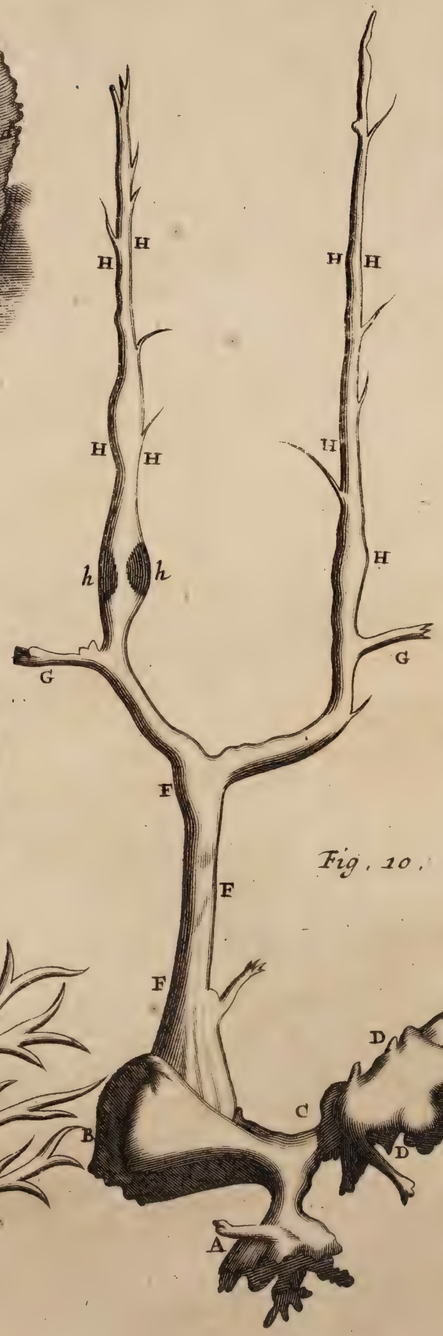


Fig. 10.

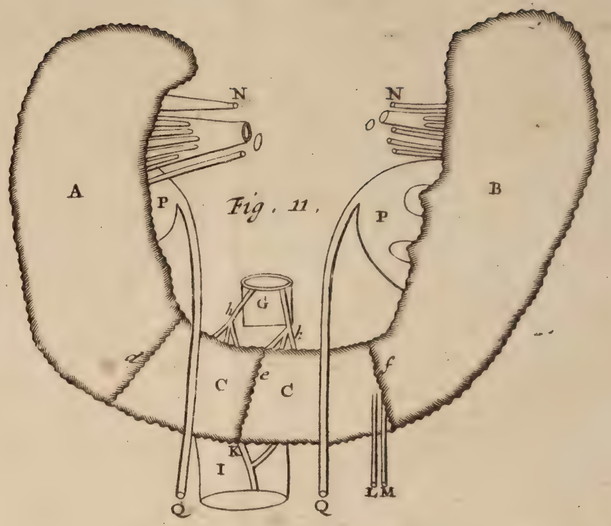


Fig. 11.

Fig. 12.

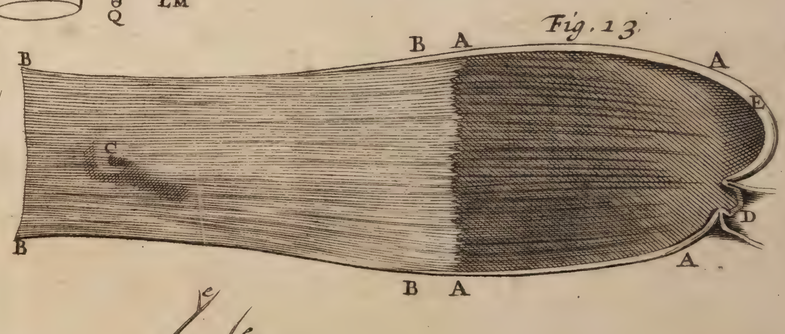


Fig. 13.

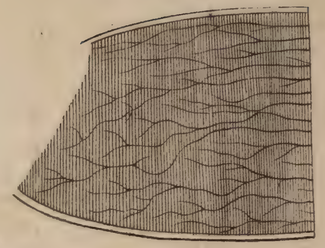


Fig. 14.

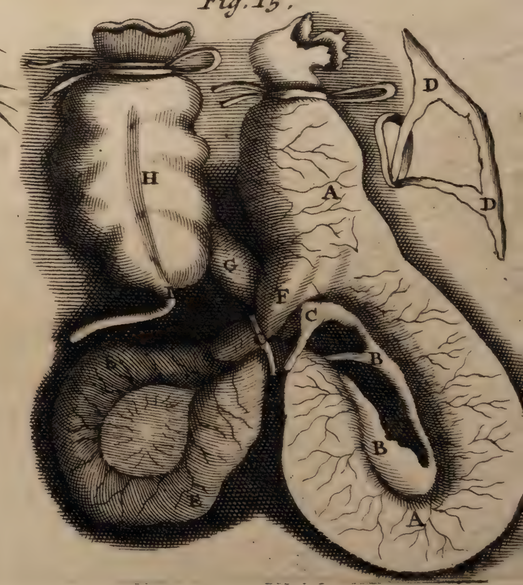


Fig. 15.

XXXIX. The curious Reſearches of many Inquiſitive Perſons after the manner of the Generation of Inſects, and their Diſcoveries therein, have much advanced the Doctrine of *Univocal Generation*. Yet one great Difficulty remains with me, how to account for ſeveral of thoſe that are bred in Animal Bodies; not ſuch as we may ſuppoſe to be hatch'd from the Eggs of the like Kind, that are receiv'd with the Food or otherways, but of which we cannot meet with a Parallel, or of the ſame Species, out of the Body, in the whole World as is known beſides. I ſhall Inſtance only in two, the *Lumbricus Latus*, and *Teres*, which remarkably differ from any others out of the Body, from whence, or from the Seed of the ſame, it may be any ways thought they may be propagated in it. But tho' we are gravel'd in aſſigning how firſt theſe ſorts of Worms ſhould come into the Body; yet being once there, there is nothing more plain, than that the *Lumbricus Teres* is propagated by an *Univocal Generation*; there being in this ſort ſo perfect a Diſtinction of Sexes, Male and Female; and the Organs belonging to each ſo curiouſly contriv'd, ſo conſpicuous and plain, that they may further illuſtrate the late Inventions of ſome; and do ſeem to ſhew, how ſollicitous Nature is in preſerving and propagating the meaneſt Species.

The Lumbricus Latus; *by Dr.* Edward Tyſon. *n.* 146. *p.* 113.

I have made Obſervations upon both ſorts of theſe *Worms*; thoſe on the *Jointed Worm* I ſhall here give you.

1. This *Worm* is *Flat*; and hence 'tis call'd *Lumbricus Latus*; and by *Hippocrates*, Ταινία *i. e. Faſcia*, and by ſome in Engliſh, the *Tape Worm*. This *Flatneſs* of the Body, ſufficiently diſtinguiſhes it from the others, which are uſually bred in the Body; and are either Short and ſmall, and then call'd *Aſcarides*; or Longer, as the *Teretes*. Nor is there any out of the Body, that I know of, that are thus *Flat*. The Breadth of this *Worm* is various, both in the ſeveral parts of the Body of the ſame *Worm*; as alſo in one *Worm* compared with any other. The Longer the *Worm* is, the Broader uſually are the latter *Joints*,

2. The *Joints* of this *Worm* are ſo ſet on, that the Lines or extream Edges of the former, come over the latter; which is to be well obſerv'd, and may direct us to that part or extream, where we may ſuppoſe the *Head* to be placed. Theſe Edges of the former *Joynt*, which ſhoots over the latter, in ſome I have obſerv'd to be Plain and Smooth; in others Crenated, and Indented; in all, by drawing it through one's Fingers from the Tail to the Head, you will find a great Roughneſs; but if the other way, from the Head to the Tail, it ſeems Smooth.

3. Many, who have obſerv'd this *Worm*, do take notice of the difference of it's *Extreams*; how much larger one is than the other; but not well conſidering the ſetting on of the *Joynts*, abundance have been miſled into an Errour, by taking the *Head* for the *Tail*. Thus *Spigelius* and *Amatus Luſitanus* make the Slender part of the Body to be the *Tail*. But in all I have hitherto obſerv'd, I conſtantly found that *Extream* where the *Head* is ſet on (if we may allow it to have any) much Smaller than the other; ſometimes not half a quarter ſo broad; in others leſſer or greater, often according

cording to the Length of the *Worm*; but in all I take notice, if they are of any conſiderable Length, that the *Joynts* towards the *Head* are vaſtly ſhorter, than towards the *Tail*: For in one I have by me 24 Foot long, there about 5 *Joynts* make an Inch, whereas the latter *Joynts* here are above an Inch long; but in ſome I have taken out of Dogs, there were 30 or 40, ſometimes above 60 *Annuli*, which towards the *Head* did make up but the length of an Inch; whereas towards the *Tail*, 6 or 7 *Joynts* did equal that meaſure, and ſometimes 3; ſo that gradually the *Joynts* ſeem to increaſe, both in Length and Wideneſs, as they approach the *Tail*. But withall it muſt be obſerv'd, that according to the Corrugation or Extenſion of theſe *Joynts*, their Dimenſions will be altered, which is moſt apparent in them when alive; That likewiſe there is a great difference of theſe *Joynts* in the various Species of this *Worm*, (for I think there are more ſorts than one.) And as to the *Differences* of them, there are theſe I have taken notice of, 1. That in moſt, the *Joynts* gradually, and very ſenſibly, increaſe in Length; But in a vaſt Quantity of this *Worm*, voided by a Perſon here in Town, but in ſeveral pieces, 2, 3, 4, or more or fewer Yards long, I obſerv'd for a great length the *Joynts* much the ſame; but I ſuppoſe I ſaw here neither the *Head* nor *Tail*. 2. In ſome thoſe *Orifices*, which I take for *Mouths*, were placed about the middle of the *Joynts*, on the Edges; in others, about the middle of the *Flat* of the *Worm* near the *Joyntings*. 3. Theſe *Juttings*, or Lips of the Upper *Joynts* over the Lower, in ſome were plain, in others Crenated, in others, the great protuberatings at the Side render'd the whole *Worm* Serrated. 4. Uſually the ſame *Joynt* is much of a bigneſs throughout; but the Upper Extream ſomething leſſer than the Lower. But in one I took out of a Dog, I obſerv'd that in ſome of the laſt *Joynts* towards the *Tail*, the upper part of the *Joynt*, by which 'twas faſten'd to the fore-going *Joynt*, was very ſlender, in the middle broad, and towards the other *Extream* grew Taper again. But in another I took out of the ſame Dog, I could not obſerve the ſame thing; as neither did I in a 3d, I took out of another Dog, which was about 2 Yards long; whereas theſe were each 1 Foot or 1½ Foot long. 4. This *Worm* lies Convoluted in ſeveral places; and it is ſometimes as long as all the Guts, and ſometimes vaſtly exceeds that length. *Olaus Borrichius* tells us, that a Patient of his, in a Year's time, has voided 800 Foot of this ſort of *Worm*, but in ſeveral pieces, and that hitherto he has not met with the *Head*. For the Patient obſerv'd, that always in the Voiding it, he perceived it break off. I can Parallel this with an Inſtance of a Perſon here in Town, once my Patient, who has voided vaſt Quantities of this *Worm*, for ſeveral Years together; but in ſeveral pieces, 2, 3, 4, 6 or more Yards long; but all put together, would much exceed the length of that of *Borrichius*. But to be at any certainty in this particular, I think is very difficult: For when it comes to any conſiderable length, by lying in ſeveral Cluſters, or Convolutions, in the *Inteſtines*, the Deſcent of the *Fæces*, eſpecially being quickn'd by a Purge, will be apt to break part off; which yet ſtill will live, and grow till quite carried out of the Body. Beſides, I queſtion whether all thoſe pieces which are Voided by the ſame

Act. Med. Farthol. Vol. 2. Obſ. 47.

Perſon,

Perſon, may be always reputed parts of the ſame *Worm*, or of different. But this is undeniable, that this *Worm* is vaſtly Long, which plainly appears, even by thoſe pieces we ſee of them; for beſides the Inſtances mention'd by ſeveral Authors, I have a piece of one by me of a great Length, Voided by a Young Man about 20 Years of Age, upon the Uſe of an Emulſion of the Cold Seeds. He dragg'd it from himſelf, not without ſome frightful Apprehenſions, that Guts and all were coming out; he plainly perceiv'd it alive, and to move; and having put it in a wide mouth'd Glaſs, it often endeavour'd, by raiſing its Body, to get out; but the Cold Water, into which it was put, afterwards ſoon kill'd it. I meaſur'd it, and found it 24 Foot long. In it I numbred 507 *Joynts*. It's Colour was extream *White*, being Turgid with Chyle; its Body *Flat*, about the thickneſs of Half a Crown, where thickeſt; and the *Joynts* towards the *Tail* about $\frac{1}{4}$ of an Inch broad; thoſe toward the *Head* about $\frac{1}{4}$ as broad as thoſe towards the *Tail*; and here the *Joynts* were not $\frac{1}{4}$ of an Inch long, whereas thoſe at the *Tail* were of a full Inch long, and ſomething more, and from the *Head* they ſeem'd gradually to increaſe in length. The *Joynts* much of a wideneſs throughout; and the Jetting Edges of the former over the latter uſually Plain and Even; unleſs where the Contraction of the Body had rendred them a little Crimpled. The *Flats* of both ſides, juſt alike; and without any Spots, Protuberances, or any thing remarkable, which might diſtinguiſh them, or be obſerv'd, onely a Smooth Superfice; but about the Middle of the Edges of each *Joynt* I obſerv'd a protuberating *Orifice*, which would eaſily enough admit of a Hog's Briſtle, and was open and apparent to the naked Eye. Theſe *Orifices* were placed for the moſt part alternately, in one *Joynt* on the Right ſide, in the following on the Left. But ſometimes I have obſerv'd them in 2, more ſeldom in 3 ſucceeding *Joynts* of the ſame ſide; but never in one *Joynt* more than once. Theſe *Orifices* I take at preſent for ſo many *Mouths*.

But ſince I have here mention'd of what *Length* they have been obſerv'd in Man, I ſhall alſo add how *Long* thoſe were I have ſeen in *Dogs*. For tho' they are to be met with only in the Animal Kingdom, yet in abundance of the Subjects of this, and thoſe too of different Species; they are very frequent in *Fiſhes*, as in Pikes, Whitings, Bleakes, Crabs, Herrings, *&c.* and upon this ſcore ſometimes they prove a great Damage to the Merchants, as *Platerus* Obſerves, they being forc'd to fling them away; In *Bleaks*, in the Summer-time, if you open thoſe that Leap and Tumble in the Water, from the Torment they feel within, you ſhall almoſt conſtantly meet with this *Worm*. In *Oxen* often they are obſerv'd likewiſe; not ſo much in *Calves*; in *Dogs* very frequently. I have often times found them here my ſelf in Diſſection. I met the firſt time with two; there was indeed another piece, which I take only as broken off from one of the former, becauſe here both *Extreams* were pretty large, and the *Joynts* throughout proportionably long: But in the two others the Diſproportion was very remarkable; For beſides obſerving here their *Heads* Hiſpid, or thick beſet with Hairs or ſmall Spikes (which I ſhall afterwards deſcribe) I took notice that *Obs.* l. 1.

this *Extreme*, if extended, was very ſlender, and when a little contracted, the *Joynts* ſo very ſmall, that they were ſcarce diſcernable by the naked Eye; but where I could better diſtinguiſh them, between 30 or 40 made the length of an Inch; but towards the other *Extreme* or *Tail*, in one four, in the other 6 or 7 *Joynts* made that length. One of theſe *Worms* was ſcarce a Foot long, the other not a Foot and a half. In another Dog, I afterwards Diſſected, I found another *Worm* with juſt the ſame *Head*, but about 5 Foot long; towards the *Head* in this 60 *Joynts* ſcarce made an Inch, but at the *Tail* about 3 did equal that ſpace; and the *Joynts* here were about a quarter of an Inch broad; and in the ſides of the *Joynts* in this I plainly perceiv'd thoſe *Orifices*, I at preſent call the *Mouths*.

5. The *Head* of this *Worm* is *Obſcure*, and has created many Controverſies amongſt the Curious *Anatomiſts*; who yet have been forced to confeſs, after obſerving vaſt Quantities of this *Worm*, that they are ſtill at a loſs, and know nothing certain of it. But what I have obſerv'd of the *Head* of this *Worm*, in 3 ſeveral ones I have taken out of the Bodies of Dogs upon Diſſection, where I know I have them whole, makes me to be ſomething more at a certainty. I open'd a Dog at the *Colledge* of *Phyſicians*, and found a *Worm* alive in the *Ileon*; not lying ſtraight, but in many places winding, and doubling. Having taken notice how the *Joynts* were, I traced it up, by carefully opening the *Inteſtine*, to the ſmalleſt Extream, where I expected the *Head* to be; and which did lie towards the *Duodenum*, whereas the Broader End was downward towards the *Rectum*; and this Broad End was free, and did nothing adhere, whereas that Smaller Extreme did ſo firmly ſtick, and had faſten'd it ſelf to the inward Coat of the *Inteſtine*, that it was not without ſome trouble, by gently raiſing it with my Nail, that I freed it from its Adheſion. Having lifted it up, I carefully view'd it; and did obſerve neither that *Biceps*, in *Tulpius*'s firſt Figure, nor the *Head* like a *Tricoccos*, as in *Mich. Febr*, but a very ſlender Body, which being alive it would ſometimes ſhoot out a conſiderable Length, at others, retract it in again, and ſo very much alter it's Figure, by becoming broader. But whilſt I was doing this, by it's wriggling its Body, it happening to fall off my Finger, it preſently took hold again, and gave me as much trouble to free it a ſecond time from it's Adheſion, as at the firſt. I put it for the preſent into Spirit of Wine, that I might more carefully view it with a *Microſcope* at home: And in doing this, making uſe of ſome extraordinary good ones, it very plainly appear'd, as is repreſented in the 20 *Figure*, thick beſet with two orders of Spikes, or Hooks, whereof the larger did ariſe from the Center or Middle, ſpreading themſelves over the Edges of the Circumference; the other, which were leſſer, iſſuing out about the Middle from the Center, and were ſhorter, as is ſeen in this *Figure*, and are repreſented ſideways in the 21. I could not upon my ſtricteſt Enquiry, and with extraordinary Glaſſes too, inform my ſelf of any *Orifice* here, which we may ſuppoſe to be the *Mouth*; only a little Indenting there was in the Center, occaſion'd by the iſſuing out of the Spikes thence. This End was not perfectly Flat, but a little Globous; and I could perceive by the Swelling a little

Fig. 20.

Fig. 21.

little below on the *Neck*, and wrinckling of the Skin, as in the *Figures*, how it did ſhoot out, and contract it's *Neck*, as I obſerv'd it when alive. For ſome little ſpace here, I could not obſerve with the Glaſſes, any *Joynts* at all; but after, very thick ſet, and ſmall, and gradually increaſing in Length, as they deſcended towards the *Tail*. The *Heads* of the other two *Worms* exactly appear'd the ſame in the *Microſcope*, as this deſcribed; and afterwards, by carefully viewing them by my naked Eye, I could obſerve theſe *Hairs* or *Spikes*.

It was objected by ſome Ingenious Perſons, Whether theſe *Spikes* or *Hairs*, might not be like the ſmall Feet of the *Tick* or *Ricinus*, for it's faſtening it ſelf the better to help it's Suction. And indeed were it Blood it liv'd upon, the Caſe were plain; but ſince 'tis *Chyle*, what ſervice they could do it in this, I do not ſee; for when they faſten, the *Head* is deep immerged in the Inward Coat of the *Inteſtine*, and ſo may be thought for that time to get but a very inconſiderable Soop, if any; and nothing in proportion to what is requiſite for ſo vaſt a long Body, and what it is often obſerv'd to be Turgid with. Upon the whole, what ſeems moſt agreeable to me, and to be the true Uſe of this part, we call the *Head*, is this; that by the Means of theſe *Hooks*, and *Spikes*, it might faſten it ſelf, and ſo prevent its too eaſy Ejection out of the Body. For it being ſo very long, and large too, and its Body in many places Winding, and Convoluted, the Deſcent of the *Fæces* upon all Occaſions would be apt to carry it out with them, had it not this hold; which is ſo faſt, that rather than looſen it ſelf, parts of the Body are ſooner broken off, which we frequently ſee in the Stool. When it penetrates the Coat of the *Inteſtine*, it contracts its *Hooks* in, and draws up its *Head* to a Point; then expands them, and takes firm hold of the *Membrane*, by darting its ſeveral Poniards into it; which excites thoſe intolerable *Pains*, which thoſe that are troubled with them, ſo much complain of, that I have known it to that Extremity, that ſome have been ſcarce diſſwaded from offering Violence to themſelves, to free themſelves, as they thought, from a great Miſery; and hence it is that this *Worm* is ſo difficult a Cure, that tho' by Medicines, and Purges, vaſt Quantities at times may be brought away, yet ſome can hardly get a perfect Cure all their Life-time; as I know of one, who for above 20 Years has been afflicted with it, that has had the Advice of ſeveral Able and Eminent Phyſicians.

6. But ſince in this *Head* we find no *Mouth*, we muſt ſeek it ſome where elſe. I am very ſenſible with how great difficulty my preſent thoughts concerning this will be receiv'd, and how obvious to all 'twill be to raiſe Objections. But if what I here offer be true, others will find it likewiſe; if not, I ſhall not think my ſelf oblig'd to believe it. Why at preſent I think thoſe *Orifices* in every *Joynt* to be ſo many *Mouths*, I ſhall now give my Reaſons. I have already obſerv'd them to be of two ſorts; that in ſeveral *Worms*, both from Human Bodies as alſo in thoſe of Brute Animals, they are placed much about the Middle of the *Joynts* on the Edges; moſt frequently alternately, in one *Joynt* on the Right Hand in the other on the Left; ſometimes in two, ſeldom in more, on the ſame

ſide;

ſide; they are Protuberant, ſomething like a *Papilla*, and in the Middle a *Foramen* eaſily enough to be perceiv'd by the naked Eye, and will readily admit a Hog's Briſtle. In the other ſort, theſe Protuberances are placed about the Middle of the Flat of the *Worm*, towards the upper part of the *Joynt*, and ſeem to be repreſented by *Spigelius*, *Sennertus*, and *Tulpius* in their Figures of this *Worm*; tho' with ſome Miſtakes; and is that, which Authors mean by their *Maculæ Nigricantes* in their Deſcriptions of it.

I ſhall here chiefly inſiſt upon the former Sort, which has occurr'd moſt commonly to me; and a ſhort black Line here, placed tranſverſe to the Body, I think was the firſt that gave me notice of them: Tho' ſince, in others I have not ſo conſtantly ſeen it, but only a Protuberant Orifice about the Middle of the Edges of the *Joynts*. That theſe are ſo many *Mouths*, I ſhall Argue *Firſt*, from the great Quantity of *Chyle* they are often Turgid with. *Secondly*, from the great Appetite, but more often Thirſt, and almoſt always that Emaciation which they occaſion. *Thirdly*, That there is no other *Mouth* beſides obſerv'd. *Fourthly*, That no Uſes can ſo fitly be aſſign'd to theſe *Orifices* as their being *Mouths*.

As to the *Firſt*, None, who have obſerv'd them, but muſt confeſs that they are often very Turgid; as that I have by me 8 Yards long, at firſt did very plainly appear; and having put it into Spirit of Wine, I found after a little while it had muddied it, by Spewing out a large Quantity of a Chylous Juice; which made a deep Sediment at the Bottom: as likewiſe it did a ſecond time, having charg'd the Old, and put it in freſh Spirits. Whence all this ſhould iſſue I cannot ſee, but by theſe *Orifices* at the Sides; which firſt I ſuppoſe had receiv'd, and licked it in. And being in ſo large a Quantity, how otherwiſe could it be well receiv'd into the Body, but by theſe many *Mouths*; which being always open, and lying of all ſides too, do greedily exhauſt, and devour the beſt part of the *Chyle*, and Nutritious Aliment. 2. That hence may be well accounted for, that *Appetitus Canınus*, that great Thirſt, that *Atrophy*, I mention'd in my *Second* particular, and are often obſerv'd in thoſe, that are afflicted with this *Worm*. But had they but one *Mouth* how could they do this? But having as many, it may be, as the *Lacteals* themſelves, 'tis no wonder that they rob them, and by their nimble ſupping it up, prevent its paſſing into them. That thence we muſt neceſſarily expect an Extenuation of our own Bodies, in proportion to the Increaſe of theirs; ſince the Nouriſhment we receive is but what they leave us; and that too more of the beſt; and corrupted likewiſe with their Recrements. 3. I Argue, that theſe *Orifices* are ſo many *Mouths*, for if we do not admit them to be ſuch, I know not where in the whole Body to find them beſides. For in that part we call the *Head*, even our *Microſcopes*, as I have obſerv'd, cannot diſcover any; and thoſe too, that gueſſed it to be there, they all acknowledged it to be very ſmall; and it being ſo, and but ſingle too, I cannot ſee how it can take in ſo great a quantity of *Chyle*, which would be neceſſary for maintaining ſo great a Body, of ſo great a Length: For it can lick up no more, than what juſt comes in its way; ſo that the open *Mouths* of the numerous *Lacteals*, would be too hard for it, and

quickly

quickly ſtarve it. Beſides, ſince it nuzzles its *Head* ſo deep in the Coats of the *Inteſtines*, at that time at leaſt, it may be thought incapable of getting ſcarce any thing at all. But the *Uſe* I have aſſign'd that Part, I am apt to think, will ſatisfy others, as well as at preſent it does my ſelf. Therefore 4. Why I think thoſe Orifices *Mouths* is, becauſe I cannot think what they are beſides. For to take them for ſo many Vents of their Excrement would be more unreaſonable, ſince 'tis pure *Chyle* which they receive; which will not afford much, at leaſt ſo groſs an Excrement, as to need ſo many and large Orifices for the voiding it. And why ſo many *Anus*'s when but one *Mouth*? 'Tis eaſier to imagine them *Bronchiæ*, or *Lungs*; which in Inſects are obſerv'd in all the *Annuli*, or *Joynts* of the Body; but withall I muſt obſerve, with how much difference from our Subject. For in them you ſhall conſtantly ſee theſe *Orifices* of both ſides in each *Annulus*, but in our *Worm*, never but of one ſide; In thoſe, they are not near ſo open, and large, as in this *Worm*, even ſo much, that I cannot ſee how it can be avoided, but that the *Chyle* muſt ſlip into them, and ſo ſpoil them for being *Lungs*; And indeed, what Uſe can we imagine of ſuch here, which muſt almoſt conſtantly be occluded, either by Filth or *Chyle*. If I miſremember not, by preſſing them gently with my Fingers when freſh, and Turgid, I obſerv'd *Chyle* to iſſue out of them. So that I think I have little reaſon to doubt, that the *Chylous* Sediment in the Spirit of Wine, I had immerged them into, came hence. Upon the whole, what I have here offer'd, I think, is ſufficient to render my Conjecture Probable. And yet I have more Reaſons to add why theſe *Orifices* ſhould be *Mouths*; becauſe the *Joynts* when broken off, yet ſtill do Live; and that too, as may be thought, for ſome conſiderable time; which they could not, unleſs they had *Mouths* in each, which might receive the Aliment for the ſupport of it. Which brings me to the Laſt Particular I propoſed, for Diſcriminating this *Worm* from all others out of the Body, and ſhall now Diſcourſe of.

7. It has been ſtiffly maintain'd by Authors of great Note, both Modern as well as the Antients, That the *Worm* it ſelf ſcarce *Lives*; and is only a *Spolium* of the *Inteſtine*, or at leaſt, it is not One, but many *Worms*, included in that Membrane. But ſuch Opinions ſeem wide of the Truth: For many Phyſitians have obſerv'd it to *Move*, and therefore to be an Animal and *Alive*. And a remarkable Inſtance I had of it, in that I met with upon Diſſection of a Dog in the Theatre of our *Colledge*; where I particularly obſerv'd the manner how it perform'd its *Motion*, which was very pleaſing, and in different Forms. For though all was perform'd by Contracting and ſhortning the *Joynts*; yet ſometimes it rendred the Body, that was Flat, Round and a *Cylinder*; other times it made a deep Hollow or Concave on one ſide, and a Convex on the other; but moſt times there was a Bellying out at the Edges, about the Middle of the *Joynts*; and tho' that part towards the *Head* was very Slender, yet upon Contraction it would become as Broad as the laſt *Joynts*. This Contraction of the *Joynts* I ſometimes obſerv'd, at ſeveral places at the ſame time at ſome diſtance from one another; which muſt needs much advantage its Progreſſive Motion; ſince being of ſo great a Length, otherwiſe it could

could make but ſmall advance; which is perhaps requiſite, that it may recover it ſelf, when the Deſcent of the *Fæces* do drive it downwards. And for the advantage too of its *Motion*; at every *Joynt* there is a Prominence of the former over the latter; which like ſo many Scales on the Belly of other *Reptiles*, do perform the Uſe of Feet.

But I find ſome Authors, who admit this *Worm* to be *Alive*, yet Aſſert that 'tis not One, but many *Worms* link'd together and included in a *Spolium* of the *Inteſtines*, and that this *Spolium* it ſelf is not *Animated*, but receives all its Senſe and Motion from the *Cucurbitini* included in it. This *Gabucinus* very plainly, as he tells us, diſcover'd in a part of this *Worm*, ſhew'd him by a Perſon that Voided it. *Hæc Portio* (ſays he) *ſeſe commovebat, quo factum eſt, ut avidius* Motus *ipſius cauſam veſtigarem; diligentiſſimè tandem perquirens per ejus totam Cavitatem,* Cucumeris *ſimilium* Animalium *Seriem ſeſe* moventium *ipſi* Motum *præſtare conſpexi: Quæ ex ea, veluti ex quodam Lectulo, prodibant, interdum unum, duo ſimul interdum complicata, plerumque quatuor plurave: atque eam abraſionis portionem, quæ vacua ab hujuſmodi* Cucurbitinis *ſegmentis* Animatis *erat, nullo pacto* moveri, *imo ſubſidere.* But I very much ſuſpect this particular, becauſe in that I met with in a Dog in the *Colledge Theatre* whilſt *Alive*, and in my Hand, a *Joynt* or two fell off, but I could no ways obſerve any Membrane hanging to the foregoing *Joynt*, out of which it might ſlip, but it broke off entire. And altho' there were two ſingle *Joynts*, which I found in the *Inteſtine*, upon the firſt opening it, yet there was nothing I could ſee affixt to the laſt which might include them. And indeed the ſetting on of the *Joynts* here is ſuch, that it ſeems to me ſufficient to ſhew, That this *Worm* cannot be a continued Membrane Articulated only by the ſeveral *Cucurbitini* included in it, ſince there is ſo large a Protuberance of the Lower Extream of the foregoing *Joynt*, over the Upper part of the following; which I plainly perceiv'd in this *Worm*. If only a Membrane, why conſtantly, and thus regularly, a difference of both *Extremes*, as to their Length and Breadth? How happen the *Hooks* at the *Head*? How are thoſe *Orifices* form'd at the *Edges*, or on the *Flat* of the *Worm*? And if it was ſo as *Gabucinus* imagin'd, I cannot think but I muſt have perceiv'd ſomething of it, in thoſe ſeveral pieces of this *Worm* which I have obſerv'd; and eſpecially in that 8 Yards long, where I open'd ſeveral *Joynts*, and could find no ſuch thing. That *Mucous* Matter therefore which is obſerv'd to be Voided by thoſe troubled with them, which he tells us the Women there take for the Beds of this *Worm*, may be better accounted for; it being likely in a great Meaſure to be but the *Mucus* of the *Inteſtines* themſelves, or a Slimy *Spolium* caſt off from theſe *Worms*. Thus Leeches I have obſerv'd, being put into Water, do caſt out a Slime, which covers their Bodies, which afterwards they ſlip off, and is found in the Bottom of the Glaſs in the Form of a Mucous Coat. So Earth-Worms do void a large Quantity of a Mucous Liquor, at ſeveral parts of their Body; ſo Snails, *&c.* Upon the whole, I ſee nothing why we may not juſtly aſcribe that *Life*, we find here, to the *Lumbricus Latus* it ſelf, and not to any Animals we may fancy it pregnant with.

De Lumb. *Comment. n.* 3. *p. m.* 34.

And

And what I do give to the Whole, I muſt attribute likewiſe to the ſeveral Parts of it, even when ſeparated from the reſt of the Body; and can't but think that They do *Live* likewiſe. For, beſides thoſe Conſiderations I have already deliver'd, to prove that in every *Joynt* there is a *Mouth* for receiving the Food, (and no doubt anſwerable *Organs* for the *Digeſtion* and Diſtribution of it,) I have alſo obſerv'd that both Single *Joynts*, and often larger Pieces have been Voided *Alive*; and where vaſt Quantities of this *Worm* too have been Voided at the ſame time, in abundance of Pieces I have obſerv'd them almoſt equally Turgid, and alike fill'd with *Chyle* in proportion to the Magnitude of the parts. Now I cannot think that in Voiding it can always be broken into ſo many Pieces; and if it be done ſome time before, and they lie dead in the Body, they muſt be emacerated, and different from what they appear. But that Obſervation I have already often mention'd, of that *Worm* I met with in the Dog I Diſſected in the *Colledge Theatre*, does furniſh me with ſomething appoſite to our purpoſe. For here, about the middle of the *Worm*, as it lay in the *Inteſtine*, about a Foot and a half from the *Tail*, or Lower Extream, I obſerv'd two Single *Joynts*, about $\frac{3}{4}$ of an Inch long, *Alive*, and which continu'd their Motion briskly for $\frac{3}{4}$ of an Hour, or more, in Warm Water. That theſe were broken off from the *Tail*, I nothing queſtion, being in all reſpects ſo like them; And that it muſt be done ſome time before, I am apt to think, becauſe they were ſo remote from it. For they could not otherwiſe eaſily, being but Single *Joynts*, make ſo great an Advance, being upon all Occaſions liable rather to be driven down, not being able as I could obſerve any ways to faſten themſelves, and ſo reſiſt the Force of the deſcending *Fæces*. Which is the Reaſon, when broken off, they are ſo frequently voided.

Upon the whole, I have been ſometimes apt to think, what Analogy there may be between this *Joynted Worm*, and *Knotted Plants*; of which each Joynt can ſo eaſily propagate itſelf. And whether it may not be thought an *Animal*, *Plant-Animal*, or *Zoophyton*, bred in Animal Bodies; ſince ſo large and frequent Detruncations of the Body doe not deſtroy the Life of the Whole; Which I think can ſcarce be Inſtanced in any Animal beſides.

Explication of the Figures.

Figure 16. Repreſents a *Worm*, or rather Part of a *Worm*, voided by a Young Man in *London*; which was 8 Yards long. The leſſer Extreme, is that part towards the *Head*; the broader, the *Tail*. The Protuberances, about the middle of the Edges of the *Joynts*, are the Orifices I take for *Mouths*.

Fig. 17. A *Worm* I took out of a Dog, which was about 5 Foot long; and was *Alive*. The ſmall End ſhews the *Head*; as it appear'd then to the naked Eye. The two Protuberances at the Sides, are the *Mouths*. The broad End the *Tail*,

Fig. 18. I met with this *Figure* in *Franc. Sanchez*, which tho' rude and plain, yet very well repreſents thoſe Orifices, which I take for the ſeveral *Mouths* of this *Worm*.

Fig. 19. Repreſents the Protuberance or *Papilla* about the Middle of the Edges, (as view'd with a *Microſcope*,) and in it the Orifice which I take for the *Mouth* of this *Worm.*

Fig. 20. Is the *Head* of this *Worm* (as it appear'd in the *Microſcope*) in 3 ſeveral ones I took out of the Body, upon Diſſection; wherein is obſervable a double Order of *Spikes* or *Hooks*, the Longer ariſing from the Center, the other more towards the Edges, which at pleaſure it can Contract, or Protrude; and with them, part of the Neck too, as does appear by the Swelling cut a little below, as it is very curiouſly delineated (as likewiſe the other *Figures*) by *Rich. Waller*, Eſq;

Fig. 21. A Side-Proſpect of the *Head*, and the *Hooks* in it, of the ſame *Worm.*

The Lumbricus Teres; *by Dr.* Edw. Tyſon. *n.* 147. *p.* 154.

XL. That common *Round Worm*, which Children uſually are troubled with, is by *Hippocrates* nam'd σεσγγύλος; by *Celſus*, *Teres.* It is uſually about a Foot long; but the *Male* is generally leſſer than the *Female*: So that by their bigneſs in the ſame Body, I have before Diſſection been able to diſtinguiſh the Sex. They are about the bigneſs of a Wheat Straw, or a Gooſe Quill, and their Colour White. I did not obſerve thoſe *Feet*, or Aſperities on the *Annuli*, as in the *Earth Worm.* At both Extremes they grow narrow. Their *Mouth* is compoſed of three Lips; ſo the *Leech* hath 3 Cartilaginous Teeth ſet in a Triangle, by which they make the Wound in the Skin in Suction. The *Anus* is a Tranſverſe Slit a little before the Extreme point of the *Tail.*

In opening the Body, I found I cut thorough a large Muſcle under the Skin: Which Muſcle in *Earth-Worms* I find is Spiral; as in a good Meaſure is their Motion likewiſe; ſo that by this means, like the Worm of an Awgre, they can the better Bore their paſſage into the Earth. Their Reptile Motion alſo may be explain'd by a Wire wound on a Cylinder, which when ſlipt off, and one end extended and held faſt, will bring the other nearer it. So the *Earth-Worm* having ſhot out, or extended its Body, (which is with a Wreathing) it takes hold by thoſe ſmall *Feet* it hath, and ſo Contracts the hinder part of its Body. Likewiſe I obſerv'd, that dividing this part, there iſſu'd out a copious *Ichor*; which is naturally diſcharg'd by ſome Pores, or ſmall Vents, in the Skin; which in the *Earth-Worm* is of great Uſe, by rendring the Surface of the Body ſlippery, that ſo it might the more eaſily glide into the Earth. And in theſe other *Worms* of the *Inteſtines*, this Humour (as in *Leeches*) makes a Covering to the Body, which is often caſt off, and obſerv'd as a *Mucus* in the Stools of thoſe troubled with them.

In theſe *Teretes* of Animal Bodies, I never obſerv'd thoſe tranſverſe *Diaphragms* which are ſo numerous in *Earth Worms*, and do interſect, or rather ſo deeply depreſs, the *Inteſtine.* *Fig.* 22, 23. The Paſſage from the *Mouth* was ſomewhat ſtraightned for a ſhort ſpace, and was diſtinguiſh'd, as in the *Figures*, from the following *Ductus*; which was a ſtraight *Inteſtine* continu'd to the end of the Body, without any winding or other diſtinction of a Stomach, that I could obſerve. In the *Male* I obſerv'd a *Penis*, a *Veſicula Seminalis*, and a *Teſtis:*

Teſtis: in the *Female* a *Pudendum*, *Vagina Uteri*, *Cornua Uteri*, and *Spermatick Veſſels*.

In the *Male*, the *Penis* was plac'd at the *Tail*, or oppoſite Extreme to the *Head*; and ſeem'd to be able to exert it ſelf almoſt the length of a Barley-Corn, or proportionably to the length of the *Vagina* in the *Female*. At the Root of the *Penis* was inſerted the Neck of the *Veſicula Seminalis*, which gradually grew larger as it aſcended in the Body, and uſually did reach almoſt half way. 'Twas fill'd and Turgid with a *Milky Juice*, which it receiv'd from a ſlender *Veſſel* of the ſame Colour inſerted into it; which after one turning, was afterward very much Convoluted, and being ſo forms that Body I call the *Teſtis*. And altho' this Part be ſo looſely contexed, as even to the naked Eye it appears but as a continu'd Veſſel, and may eaſily be unravell'd its whole length, which I meaſur'd was above a Yard: Yet I make no difficulty of giving it the name of a *Teſtis*, ſince 'tis now ſufficiently known, that the *Teſtes* in more compleat Animals are only a *Congeries* of *Veſſels*. And a *Rat*, beſides this *Worm*, is not the only Subject wherein I have found them thus looſe and eaſily ſeparable.

In the *Female Worm*, almoſt about the middle of the Body, but more towards the *Head*, I obſerv'd an Orifice or *Pudendum*, which led into the *Vagina Uteri*; which ſoon divided into the two *Cornua*, which were large and remarkable: For deſcending ſomething winding towards the *Tail*, they were then reflected again, and did each of them terminate in ſlender *Veſſels*, White as they were, but much ſmaller; and did lie in ſeveral Convolutions and Windings amongſt them. Theſe I take for *Spermatick Veſſels*. Having taken thoſe Veſſels, with the *Cornua Uteri* and *Vagina*, out of the Body, and laid them on a Paper to dry, I found from each *Cornu* to the end of the *Spermatick Veſſels*, which I had preſerved, that they meaſur'd above 4 Foot. I open'd the *Cornua Uteri*, and found them Turgid with a *Milky Juice*: Having placed a little of it upon a ſmall *Microſcope*, I plainly perceiv'd 'twas nothing elſe but an infinite Number of ſmall *Eggs*; tho' to the naked Eye it appear'd only as a fluid Body. Theſe *Eggs*, when freſh, appear'd as is repreſented in the *Figure*, cover'd with abundance of ſmall Aſperities; but as they grew dry their Surface appear'd Smooth. By comparing that ſmall Quantity I did obſerve, in which I could diſtinguiſh ſo many *Eggs*, with the whole Subſtance contain'd in both the *Cornua*, I cannot gueſs there can be ſo few as 10000 *Eggs* in each *Female-Worm*. *Fig.* 25.

How far different this *Worm* is from common *Earth-Worms*, as to theſe Parts, I need only refer to Dr. *Willis*'s Figures and Account of it to ſhew: And I am yet to learn what *Worm* out of the Body has theſe Organs thus form'd. When once there, the Caſe is plain how they Propagate themſelves, ſince the diſtinction of *Sexes* is ſo evident: So that they are much miſtaken, who ſay, that theſe *Worms* do not Generate. And I cannot but think, that they are alſo miſtaken who make them *Viviparous*; and that they were impos'd upon by the *Genital* Parts of this *Worm*; which not warily examin'd, might eaſily make them to think they are ſo many ſmall *Worms*. For they are not *Viviparous* but *Oviparous*, as I have ſhewn; and *De Anima Brutorum*. c. 3.

their containing so vast a Number of *Eggs* in the *Cornua Uteri*, as I have expres'd, does sufficiently account for that prodigious Quantity, that are sometimes observ'd to be bred, in Animal Bodies. And were it not that the greatest part of the Litter of this *Worm* is usually carry'd forth by the *Fæces*, it could not be avoided but we should be devour'd by such a *Multiparous* Enemy, which we breed in our own Bowels. That Caution therefore of *Henr. ab Heers*, I think is necessary; To avoid the giving the Powder of these *Worms* for expelling others, since we cannot be secure, but that at the same time we may sow the *Seed* for Propagating more.

Obs. Medic. L. 1. *Obs.* 9.

Explication of the Figures.

Fig. 22. Represents a *Male-Worm* open'd. *a*, Shews the 3 *Lips* of the *Worm*. *b*, The *Oesophagus*, or Guller. *ccc*, The large *Intestine*. *d*, The *Penis*. *ee*, The *Vesicula Seminalis*. *f*, The *Testis*.

Fig. 23. A *Female-Worm* opened. *a*, The *Mouth*. *b*, The *Gullet*. *ccc*, The *Intestine*, or Gut. *dddd*, The two *Cornua Uteri*. *e*, The *Vagina Uteri*. *fff*, The *Spermatick Vessels*. *g*, The *Anus*.

Fig. 24. The *Genital Parts* of the *Female Worm* Explicated. *a*, The *Pudendum*, or *Foramen*, as it appears on the outside of the Skin. *b*, The *Vagina Uteri*. *c c*, The two *Cornua Uteri*. *d d*, The *Spermatick Vessels*.

Fig. 25. The *Eggs* of this *Worm*, as they appear'd being view'd by the *Microscope*.

Lumbrici Teretes *found in an Ulcerated Ankle*; *by Dr.* M. Lister. *n.* 95. *p.* 6064.

XLI. In *Apr.* 1673. A Chirurgeon at *York* brought me about 20 *Worms*, which he had just taken out of an Ulcerated Ankle of a Girl of about 8 Years Old. She had been in great Misery for some Months; and had been sent up to *London*, where she was Touch'd and Dress'd for the *Evil*. Some time after her Return, her Pain continuing, a young Puppy was open'd and apply'd to the Sores. The Chirurgeon, who took off the Puppy, found it, to his great admiration, full of *Worms*, at least 60 in number, what those he found in the Body of the Puppy, and what he drew out of the Sore Ankle; into which, he said, they crawled down as *Worms* do into the Ground. The same Puppy was again apply'd, and at the second taking of it off I made her a Visit. I found the Leg sound all but the Ankle, which was vastly Swell'd, and the Girl otherwise Hearty and well-colour'd. I saw only one *Worm* got out into the Puppy, but a very Live and Stirring one: Many were afterwards kill'd by Injections. These *Worms* I affirm, according to my best Knowledge, (and I had the opportunity of comparing them) were of the very Species of the *Lumbrici Teretes*, which Children familiarly void from the *Guts*. They were betwixt 3 and 4 Inches long; all, about the matter, of an equal bigness, as of one Brood; something thicker than a Duck's Quill; very sharp at both ends, stiff, and exactly Round; without Incisures, visible at least, and yet could Move and Twist themselves readily enough. All the difference was in the Colour, these being much Whiter than any I have seen from the *Guts*.

XLII.

XLII. The Sugar, or Remedy, given by *Pontæus* (a Famous *Chymical Mountebank*) for *Worms* in Children, is 15 *Gr* of *Mercurius Dulcis*, with 5 *Gr.* of *Scammony*, and 2 or 3 times as much *Sugar*, made up in *Lozenges*.

A Remedy for Worms in Children; by Sir Theodore Mayern. n. 211. p. 164.

He says, that this *Dose*, which in *France* Purges Grown Persons, does nothing here in *England* on those above 15 Years Old, and ought to be augmented.

His *Mercurius Dulcis* is made without *Vitriol*, which tho' good, is yet Corrosive; he takes only Ashes with Decrepitated Salt.

XLIII. In the Dissection of a *Gazella*, or *Antilope*, brought from *Aleppo*, I observ'd several *Hydatides*, or Films fill'd with limpid Water, about the bigness of a Pigeon's Egg and Oval, which were fasten'd to the *Omentum*, and some in the *Pelvis* between the *Bladder of Urine* and the *Rectum*. I had before met with the like Watery Bags, or *Hydatides*, in other Animals, and I suspected them to be a particular sort of Insect bred in Animal Bodies, or at least, the Embrio's or Eggs of them: 1. Because I observ'd them included in an Outward Membrane, like a *Matrix*, so loosely, that by opening it with my Fingers or a Knife, the Inward *Bladder*, containing the *Lympha* or *Serum*, seem'd no where to have any Connexion or hold to it, but would very readily drop out, still holding its Liquor without spilling any of it. 2. I perceiv'd to this Inward *Bladder* there was a Neck, or White Body, more Opake than the rest of the *Bladder*, and protuberant from it; but so as I could observe an Orifice at the Extreme of it, which then to me seem'd to be occasion'd by the Retraction of some part of it inwards. By this I fancied it might, as by a *Mouth*, suck the *Serum* from the outward Membrane, and so supply its Bladder, or *Stomach*. 3. Upon approaching this Neck to the Candle, we found that it did really Move, and then shorten itself. Mr. *Rich. Waller*, being present at the Dissection, made these *Figures* of it.

The Lumbricus Hydropicus; by Dr. Edw. Tyson. n. 193. p. 506.

Fig. 26. Represents one of these Watery Bladders, inclos'd in its Outward Membrane or *Chorion*; its Shape was almost Round, only Flatted as a Drop of Quicksilver will be by lying upon a Solid. *a*, Shews the Nek, seen through the Membrane, which in

Explication of the Figures.

Fig. 27. is more plainly Represented, (the Outward Membrane being taken off) but as appearing to the naked Eye; where we may observe an open Orifice, at the Extreme of it, and that it is made up of Circular Rings, or Incisures, which in

Fig. 28. being view'd by a *Microscope*, do more evidently discover themselves. This part is Granulated with an abundance of fine Eminencies all over. The *Orifice* at the end seems here to be occasion'd by drawing it self inwards, and upon Trial we found it so, for in

Fig. 29. is Represented the Neck of this *Worm*, drawn out its whole Length and Magnified: Where may be observ'd the lessening of the Rings, and its tending to a Point at the End. And having open'd it, within we found 2 small *Strings*, *a a*, proceeding from the Neck and floating in the Liquor.

What

What these two *Strings* may be, is hard positively to Assert: Leaving others to their own Conjectures, I shall deliver mine; That this *Worm*, by protruding its Neck, Sucks from the outward Membrane (which involves it, and is furnish'd with Blood Vessels) the Moisture, or Nourishment, which is convey'd by these two *Strings* or Pipes into the Stomach or Bladder, and from whence, as there is occasion, it may be supply'd for the Nourishing the whole Body of the *Worm* again; for I am apt to believe, this Bladder is but the *Stomach* of the *Worm*, which will appear less unreasonable if we consider in some Insects how prodigiously large the *Stomach* is in proportion to the other Parts of the Body; in a *Leech* you may observe not a single but above 20 *Stomachs*, emptying out of one into another, and running the whole length of the Body. And what *Malpighius* observes of the *Silk-Worm*, that it would devour in one Day as much as the Weight of its whole Body, a *Leech* will do far more at a Meal.

De Bombice. p. 40.

Some it may be will be more inclin'd to think, that the whole is but an Egg, or *Embrio* of another Insect a forming, and that this Bladder is as it were the *Amnion*, and the Outward Coat that includes it the *Chorion*. But formerly in Dissecting a Rotten Sheep, wherein I found many of these *Hydatides*, and opening several of them, I could not observe but the same Structure exactly in all; and doubtless had they been indeed *Embrio's*, I should have met with some nearer to Perfection. These *Hydatides* therefore I cannot but think are a sort of *Worms*, or Insects *sui Generis*, and because they contain so much Water in them, and are usually to be met with in Rotten Sheep, which are *Hydropical*; I call them *Lumbrici Hydropici*.

But I do not think that all those *Cists*, to be met with in Morbid Bodies, are of this Sort. For in some I have not observ'd this *Neck* and Structure of Parts, but only a transparent Bladder fill'd with a *Lympha*. Thus about 10 Years ago, I open'd the Right Side of a Patient, a little below her short Ribs, and there issu'd out abundance of Limpid Water, and together with it, a great many *Hydatides*; that first and last, as we guess'd, there might come out about 500 of these Bladders: Most were entire and fill'd with Limpid Water; of others that were too large for the *Orifice*, the Filmes were broke; but in none of them could I observe the *Neck*, tho' I was inquisitive to find it; which makes me think them to be different from our present Subject. As are likewise those I have frequently met with in the *Ovaria*, or Testicles of Women, who have dy'd Hydropical, which I take to be only the *Eggs* contain'd there, which by an extravagant Flux of Humours into them are often Swell'd to that prodigious bigness, that I have taken sometimes several Gallons of Liquor out of them. And those Bladders of Water found in the Urine Bladder of Mr. *Smith* of *Highgate*, will come into the same Number, having observ'd no *Neck* in any of them.

Vide Inf. Sect. LVI.

I shall only add, That these *Lumbrici Hydropici* I have always found hanging to the Membranous Parts, rather than included in the Body of any of the *Viscera*, as to the *Omentum*, *Peritonæum*, or the outward Membranes that cover the *Diaphragme*, *Stomach*, *Liver*, *Colon*, or other *Intestines*.

XLIV.

XLIV. 1. The *Worm* when I Voided it, which was at the ſecond Urine, was then Alive. It was Snake-headed, of indifferent Subſtance in the middle, and ſmall at the Tail, in length above half a Yard. I was very ill before it came from me, and have ever ſince Urined a kind of Blood.

A Worm voided by Urine; by Mr. Mathew Milford. *n.* 140. *p.* 1009.

2. 'Tis moſt probable that He had a Suppreſſion of Urine for ſome time, at the firſt making whereof, the *Worm* was Voided from one of the *Kidneys* (wherein it was bred) into the *Bladder*; and at the ſecond, from thence into the Pot. It was (being Dead and Dry) of a dull red Colour, and in thickneſs about the 12*th* of an Inch.

By Mr. Ent. *Il.*

XLV. 1. A Girl in *Sheffield*, about 8 Months Old, was ſurpris'd with violent Vomiting Fits, which held her for about a Week, and made her ſo weak, that her Parents began to deſpair of her Recovery. They at length ſent for Mr. *Fiſher*, who chanc'd to ſay, *Wormwood* was good for the Stomach. He going home to fetch things proper on that occaſion, they in the mean time offer'd her ſome *Wormwood-Ale*, which ſhe took ſo greedily, that ſhe ſwallow'd down a Pint of it. And at his return ſhe Vomited up in his Preſence 3 *Hexapodes*, all very Active and Nimble. The Girl, in a ſhort time recover'd, and was well. Mr. *Fiſher* in the Afternoon brought the *Hexapodes* to me; we kill'd one of them with trying Experiments upon it. But gave either of the other two the Head of a ſhining *Atricapella*; which in about 5 Weeks time they eat up, Bones, Feathers, and all, except the Extremities of the Feathers, and the Beaks. I then gave them a piece of *Larus*, but that, it ſeems, agreed not ſo well with them, for they dy'd within 2 Days.

Animals vomited by a Child at Sheffield; *by Mr.* Jeſſop. *n.* 117. *p.* 393.

2. A Son of Mr. *B.* living not far off *Rippon*, about 9 Years of Age, in *Feb.* 167$\frac{4}{5}$, was afflicted with great Pain in his Stomach, and continual Vomitings. A Powder was given, wherein was a ſmall Quantity of *Mercurius Dulcis*. He thereupon Vomited up ſeveral ſtrange *Worms*, two of which were brought to me at *York*, the one Dead, the other Alive, and which liv'd many Days, till I put it into Spirit of Wine to preſerve it in its true Shape. Theſe *Worms* were very *Caterpillers* with 14 Legs, *viz.* 6 ſmall, Pointed; the 8 middle, Stumps; and the two hind, Claſpers; ſomething more than an Inch long, and of the thickneſs of a Duck's Quill, thin Haired, or rather naked, with brown *Annuli*, and a black Head: the very ſame, for Kind, that I have many times ſeen on Plants, and no doubt, theſe (as thoſe others) would in due time (if the place had not hindred) have ſhrunk into *Chryſalis's*, and chang'd into *Moths*. As alſo thoſe mention'd by Mr. *Jeſſop* would have chang'd to *Beetles*.

By a Child near Rippon; *by Dr.* Liſter. *ib. p.* 394.

3. A Baker at *York*, in *March* 168$\frac{1}{2}$, Vomited up a *Worm*. I found it in the Blood which came up with it, having caus'd it to be waſht for the more carefull Examination of it, much of the Blood being Clods of a kind of skinny and fleſhy Subſtance, *haud aliter quam in Mulierum Molis excernendis accidere ſolet*. Of this kind of Blood there was about 2 Pound Weight ſaved in the waſhing, and this odd Animal amongſt it. It was a dark Green Colour, like a Horſe-Leech, and ſpotted not unlike ſome of them. I could perceive

By a Man at York; *by Dr.* M. Liſter. *Ph. Col. n.* 6. *p.* 164.

Fig. 26.

ceive (when I found it) no Life or Motion it had; the Girl that washed the Blood having almost beaten off a Fin, and part of one of the Forks of the Tail, and burst the Belly of it; yet it was curiously and regularly shaped in all its Members. The Honest Man Imagin'd he drank it the Summer before in Pond-water; of which he was used to drink after sore Labour in his Calling. This is certain, he had about his Stomach and Right side a most exquisite and tormenting Pain, for at least 4 Months, which many times threw him into Horrors and Chillness, Ague-like; and indeed when he Vomited this up he was the Sickest Man I ever saw not to Die: He also voided Blood by Stool several Days.

I am at a loss where to place this Animal, for that it is not like any thing I ever yet saw in Nature. It was about 4 Inches long, and in the thickest place 3 Inches about; it had 3 Finns of a Side, all near the Head, and all of them were Thick and Fleshy: But the forked Tail was Finny and Transparent, and to be extended; it was placed Horizontally, not as that of most, (if not all) small Fish, and even *Neuts* and *Tadpoles*, or Frogs in disguise, in which particular it differs from them all, as well as in the Fleshiness of the Finns.

Besides this Odd Animal, I found the Head of another of a different Shape, but of the like dark Green Colour.

I am apt to think that we often Drink and Eat what is Alive; and it is certain some things will Live-on in our Stomachs in despite of Concoction; not to instance in the many sorts of *Gut-Worms* Natural to us, and which are bred within us, perhaps in some Children even before they are Born; these *Worms*, I say, do freely wander up and down the *Guts* and *Stomach* at their pleasure, and receive no prejudice from the Concoctive Faculty of them. And for this Reason we see *Insectivorous Birds* so sollicitous to kill *Worms*, and all other sorts of *Insects*, by drawing them again and again through their Bills, as Canes through a Sugar-Mill, that they may be verily Dead before they swallow them. And yet I am of the mind that what was accidentally swallowed by us Alive, and that shall have the power to Live on within us (especially if it shall be young and tender, and yet growing) may have its design'd Form and Shape monstrously perverted, so as to appear to us quite another thing than Naturally and really it is; and this I take to be the Case of this Odd Creature, which might have been the Spawn or *Embrio* of a Toad or Neut.

The Skinny Lumps of Blood, Vomited up with it, I think may be easily accounted for. For this Spawn or *Embryo* of a Toad or Neut, might well Venome the *Stomach* or Gut, in which part soever or Wrinkle thereof it chanced first to rest or stick, and cause an Inflammation there, and so have it self swell'd or closed up within a Tumour of its own making, which in process of time might gather to this Bigness, and at length bursting in pieces, come up together. Familiar and infinite Instances of this Nature we see in *By-fruits*, or Wens, which Insects raise upon Vegetables; which by Natural Instinct know how to invenome a Plant, and so compendiously to provide both Food and Housing for their Young.

XLVI.

XLVI. 1. The chief cauſe of thoſe riſing Tumors fixt upon my Tongue is at laſt diſcovered to proceed from the Diſeaſe of Worms. *M. de la Croſs* in his *Memoires*, having mention'd ſome Cures of this Diſeaſe of Worms by one *Sarah Haſtings*, who was very Famous in the Diſcovery of them in the Face, Gums, Tongue; and which ſhe manag'd with ſuch dextrous Art, in the Operation, that ſhe took them out of any part affected, with a Goose-Quill, one of which being in ſome reſpects like to my Caſe, I was the more curious and ſolicitous to enquire out if there were any of the Worm-Doctreſſes now in being; and hearing of one Famous at *Leiceſter*, I was reſolv'd to write to her, deſcribing all the Symptoms as plain as I could explain them; to which I had a return, That ſhe believ'd my Diſeaſe to be Worms: And being reſolv'd to try the Experiment, I took Coach for *Leiceſter*, where being come, my *Doctreſs* (Mrs. *French* by Name) no ſooner inſpected the place, but inſtantly declar'd her Opinion, that the Diſtemper proceeded from Worms. The next Day ſhe fell upon her Operation, which was perform'd in the Preſence of two Aldermen of the Town, Mr. *Gibbs*, my Lord of *Derby*'s Chaplain, and ſeveral others, when piercing the Part affected with a Lancet, ſhe drew ſome Blood, and ſoon after with a ſmall Spatula, and another Inſtrument with which ſhe open'd the Orifices, ſhe pick'd out 5 or 6 Worms at a time, ſome of which I have here ſent to you for your more curious Obſervation. She plainly ſhewed them to the Spectators as they came out of the Fleſh; they were all alive, and moved their Heads, ſomewhat leſſer than ordinary Maggots. I can tell you, that in leſs than 8 Days ſhe took out of my Tongue more than an Hundred Worms, all almoſt of the ſame bigneſs, except two very large ones, which (ſhe told me) were of a *Cankerous* Production: She took more than 30 out of my Gums, which laſt Operation is her ordinary or daily Practice; Perſons of good Note reſorting to her from all parts of the Country thereabouts. I was very curious to enquire out what Cures ſhe had done of this Nature; and I found a very ſatisfactory Account from Perſons of ſome Quality and Note. And to be ſhort, though the Operation was very ſurprizing, and ſo will (I ſuppoſe) ſeem to you Incredible; yet neither I, nor any one preſent could diſcover any Fallacy, but all the plain Dealing that Ocular Demonſtration can admit of, to prove the Reality of the Operation; which I my ſelf ſaw her perform upon ſeveral Patients while I was at *Leiceſter*. I ſhall not enter upon a Philoſophical Reaſoning about the Nature or Production of theſe Animals: But I think the Cures the Woman performs in picking out theſe Worms from all Putrefactive Ulcers, Tumors, and Sores, whether in the Faces, Noſes, Gums, or Tongues of ſeveral Perſons, prove, that ſuch Animals are Generated in thoſe Parts. I have receiv'd ſome ſenſible good, and hope to have more Relief by her next Operation.

An Account of Worms found in ſeveral parts of the Body, by Mr. Tho. Dent. n. 213. p. 219.

Mem. for the Improvement of Nat. Philoſ. Lond. 1693.

2. She put the Caſe beyond all Diſpute; (1.) By ſhewing me the Head of the Worm in the Orifice before ſhe extracted it. (2.) He was ſtill ſenſible of their approach before ſhe could ſee them. (3.) She deſign'd, what he intended to have done, that an Inciſion ſhall when he comes to Town, be made

Further Confirm'd; by Mr. Mark Lewis, ibid. p. 222.

made in the Place, that if Worms be not then found, ſhe may then be well ſpoken of.

To me ſhe gave a Catalogue of ſeveral Cures ſhe had done in the Town and Country, one was my own Relation, I know to be a Truth.

Thus far we went over Night, ſhe took 15 or 16 Worms out next Morning. I found Mr. *Newton* deſirous to ſee the Operation, he was a Stranger to us both; but we comply'd with his deſire, were extreme glad of his Company, when he told us it was on your account.

He took the ſame Care I had done, ſaw the ſame Effects I had done over Night, only now there were not above 10 Worms; they came by two at a time, once as I remember three.

I deſign'd to have ſent you ſome to compare with yours; told her of the Fraud my Friend, Mr. *Popple*, had detected in the *Stamford-Woman*.

I had provided ſome ſoft Cotton in a ſmall Box, but why, I know not, they now all dy'd the ſame Day before I was got home, when as formerly I had kept them 14 or 15 Days; they had Faſted 3 Days before I had them.

I had the Curioſity to try whether I could find any Blood in them, but did not; which makes me think they feed of the ſame Humour they are bred of.

The Long-worm in the Fleſh in the Eaſt-Indies; *by* ..... *n.* 225. *p.* 417.

XLVII. A few Days after my arrival at *Fort St. George* in the *Eaſt-Indies*, the Fruits of my *Gomroon* Journey ſhew'd themſelves; for a little below the Inſtep of my Left Foot, a Worm put out his Head, which afterwards coſt me much trouble. Theſe Worms are bred by the Water, between *Gomroon* and *Schiraz*, eſpecially that about *Laur*; they come out in any part of the Body, and are very troubleſome and dangerous, for I have known thoſe who have kept their Bed for them, ſome 6, ſome 10 Months, and ſome there are, who have loſt ſometimes their Legs, ſometimes their Lives by them; they come out ſometimes to the length of 6 or 7 Yards; when they firſt come out, they are ſmall like a Thread, and afterwards grow bigger and ſtronger by Degrees; they wrap them up upon a little bit of Stick or Cotton, and put upon them Onions and Flower of Rice boiled in Milk. The chief care is to be taken not to break them, for then it is that they do Miſchief. When mine firſt came out for about 40 or 50 Days it came out every day by little and little, without puting me to much Pain, but that I could go up and down till it was come out a Yard and a Quarter; but afterwards, one Day ſtirring too much, I hurt the Worm and inrag'd him, ſo that he broke off of himſelf, and going in, caus'd my Foot and Leg (up to the Calf) to Swell till the Skin was ready to burſt, which kept me Sleepleſs, and caſt me into a *Fever*. I had a Chirurgeon, and kept my Bed for about 20 Days, in which time I had ſeveral Fits of the ſaid *Fever*; the Worm was broke to pieces, and came out in ſeveral parts of my Foot; but the Chirurgeon apply'd ſuch things as kill'd the Worm, and turn'd it to Matter; he then Lanc'd my Leg a little above the Ankle, and another place of my Foot, and ſo with Drawing Plaiſters drew it all out.

XLVIII.

XLVIII. A certain *Serving-Man*, about 27 Years of Age, dy'd *Hydropical*; which Diſeaſe he was moleſted with 4 Years before his Death. He was ever a *Liſtleſs*, Dull, and Melancholy Fellow, never cheerfull nor ſmiling, eſpecially for 10 Years before he dy'd. His Words came from him as if Forc'd, and Speaking but a little he would end with a Sigh. When open'd, he was found to have the Left *Lobe* of the *Lungs* almoſt quite Waſted; but no Ulcer or ought preternatural appearing in the remaining part, except its Waſting. The Heads of the Veſſels and Branches of the *Wind-pipe* as big as in the other *Lobe*. That *Lobe* of the *Liver*, which Buts on the *Midriff*, was Black outwardly for about a Hand's breadth, and about a Thumb's breadth within the *Parenchyma*.

Obſervations on a Man who dy'd of a Dropſy; *by Dr.* Nath. Fairfax. *n.* 29. *p.* 548.

XLIX. Some Years ſince, there came to a Phyſitian in *Holland* a Young Woman of about 17 Years of Age, unmarry'd and reputed a Maid, of a Florid Countenance and ſtrong Body, having a good Stomach, *peroidicè Menſtruata*, and wanting none of her due Evacuations; not troubled with Head-ach nor Sleepineſs, nor difficulty of Breathing, nor Drought, nor any of the Symptoms incident to *Hydropical* Perſons. This Young Woman having her Belly Swollen to Exceſs in 3 Months time, was much ſuſpected by the Phyſitians as if ſhe had been Deflowr'd, which yet with many Imprecations ſhe deny'd. And indeed the *Tumour* of her *Belly* being felt afforded ſome conſiderable Signs to diſpoſſeſs him of the Opinion he had of her; ſeeing it was not a Prominent nor Roundiſh *Tumour*, nor any ſuch as is uſual in *Women with Child*; beſides that, ſhe made not ſuch a Coloured and Craſs Urine as *Child-bearing* Women are wont to do: yet there appearing no Symptoms of a *Dropſy*, no Complaints of the *Stomach*, *Liver*, *Spleen*, *Kidneys*, no Swelling of the Loins or Inferior Limbs, no Leanneſs in the Body or Superior Parts, no Flaccid or Diſcolour'd Breaſts, but all being thus far in a good Conſtitution, he ſent her away without preſcribing her any Phyſick. After more than 6 Months, having Conſulted with other Phyſitians and ſome Mountebanks in vain, ſhe return'd to him. He now found her Body Dry'd and Bloodleſs, her Breath Short, her Temples Fallen in, her Noſe Sharp, her Eyes Hollow, her Skin Wan and Ill-favour'd, her Pulſe Creeping, her Appetite Proſtrate, her Tongue Dry, her Voice Weak, her Evacuations Sparing, and all her Strength Dejected; In a word, liker a *Skeleton* than a Living Body. He being now ſufficiently convinced of the Nature of her Diſtemper, though the Caſe was Deſperate, reſolv'd upon the Uſe of a *Paracenteſis* or Inciſion. But the Patient abhorring this Operation, ſhe was left to her ſelf, and dy'd 3 Months after. Her Body being open'd, there ſoon appear'd a great Lake of Water; whence at firſt it ſeem'd to be a common *Aſcites*, a Tumour of Waters ſtagnating in the *Abdomen*. Then the *Liver* being look'd after, it was no where ſeen; the *Meſentery*, *Pancreas*, *Spleen* and *Kidneys* did not appear; The *Peritonæum* was turn'd into a Bag, by a Separation made of its Interior Membrane from its Exterior, and ſo enclоſing within it the whole Bulk of that Reſtagnant Water, that not a Drop

A Dropſy *miſtaken for* Gravidation; *by Dr.* ..... *n.* 106. *p.* 131.

of it had been able to get out into the *Abdomen*. This coſt no ſmall trouble to render it conſpicuous, by emptying this Sack of all the *Serum*, and ſo diſcovering both ſides of the Bag, made up of the double *Peritonæum*, whoſe Inner Skin had been ſever'd from the Outer, ſticking to the tranſverſe Muſcles of the *Epigaſtrium*, the *Hydropical* Waters having forc'd the Inner Membrane inwards into the hollow of the *Abdomen*, and ſo forming it into the Shape of a Bag, whoſe Compaſs reach'd from the *Pubes* unto the *Diaphragme*, and from the Left Region of the Loins to the Right; ſo that the Nervous Body of the *Peritonæum* which is Naturally as thin as a ſilken Web, being here thicker and cloſer than any Ox-Hide, was by little and little expanded, as the Capacity of the Womb in *Gravidation* is ſtill more and more enlarg'd. This Bag of the *Peritonæum* being remov'd, the *Viſcera* came to view, which were not Gravelly, nor Tartareous, nor Chalky, (as they often are in *Hydropical* Bodies) but only Decay'd and Colourleſs: Which Decay by the timely Uſe of an *Inciſion* might have been prevented.

Obſervations on a Maid who dy'd of an Aſcites; *by Mr.* J. Turner. *n.* 207. *p.* 15.

L. As the Body lay along, we perforated the *Abdomen*, in the moſt Prominent part, by a *Paracenteſis*, and extracted the contain'd Liquor through a ſmall *Canula*, to the Quantity of 3 Gallons; Afterwards we laid the Corps upon a Table, in the ſame poſture, where we made Inciſion, beginning between the *Umbilicus* and the *Cartilago Enſiformis*, dilating ſtill as we emptyed, till we had made room for a Quart-Pot, with which we drew out, to the Number of 76 good meaſur'd Quarts (including the 3 Gallons extracted before) of a Subſaline, and ſomewhat Auſtere *Serum*; beſides what was imbib'd with our Spunges, not improbably 2 Quarts more. After the drying up the reſidue of this Humour (which in Colour and Conſiſtence did ſomewhat reſemble Water, wherein Fleſh newly kill'd had been waſhed, ſaving that it was of a ſomewhat deeper Red, and had a more Craſs *Hypoſtaſis*) we plainly perceiv'd, that the whole Bulk of this ſo ponderous a Deluge, was bore up and ſuſtain'd between the *Cutis* and *Peritonæum*; whereby there was made a very great Compreſſion of the *Inteſtines*, and other *Viſcera*, to the *Vertebræ Lumborum* and *Os Sacrum*. The *Muſculi Recti* of the *Abdomen* were to my Apprehenſion quite Obliterated, or at beſt, not to be diſtinguiſht from the *Carnous Pannicle*, or common Tegument of the Body; when at the ſame time the outward Covering or *Cutis* it ſelf (notwithſtanding ſo vaſt and powerfull a Dilatation) was full as Thick as in a Sound Body, in ſome places much Thicker. In the *Hypogaſtrick* Region, the *Membrana Adipoſa* was obſerv'd to be above 2 Inches Thick, and ſeem'd to be no other than a *Congeries* of little *Bladders*, each of them contain'd in its proper *Capſula*, and implete with a Coagulated *Lymphatick* Juice. The Grumous part of the Blood in the *Abdominal Veſſels* had been thrown forth in many places, and adhered in great Clots to the Membranes. The Thighs, Legs, and Feet, were *Anaſarcous*, and ſo extremely elevated with a Watry Humour, that upon a ſtrict Impreſs I could have bury'd 3 or 4 Fingers: And yet her Upper Parts, as the Neck, Face, Arms, and Hands, were wonderfully Emaciated.

The

The *Omentum*, or *Kell*, was wholly and abſolutely Waſted away; The *Inteſtines* were only vitiated in their Colour, which was ſomewhat Pallid, as if they had been Seethed; Alſo the *Ventricle*, *Pancreas*, *Liver*, *Spleen*, *Kidneys*, &c. looked all of them like Fleſh half Boil'd, and the Blood Abſorbed; For although none of theſe *Bowels* did Swim in, or Communicate with the *Serum*, being ſeparated by the aforeſaid Membrane, yet the great nearneſs of the ſuperincumbent Liquids had Polluted and Tinged the External Coats of the *Viſcera*, with their Preternatural as well as Putrefactive Heat.

The *Inteſtines* were all of them Diſtended with *Flatus's*; particularly the *Cæcum* was blown up to a very conſiderable bigneſs. In the *Colon* and *Rectum* ſome of the Excrements were Contracted like little Balls, and as Hard to bear any Impreſſion, through the Coats of the Gut, as a Stone. The *Liver* was no more Faulty than the reſt of the *Bowels*. The whole Body of the *Spleen* adhered to the *Peritonæum*, but eaſily to be ſeparated from it. We could not diſcover in the *Kidneys* any Impediment, or Let, to the Secretion of the *Serum Sanguinis*, in caſe any Attempt had been made upon thoſe Parts by a *Criſis*. The *Veſica Urinaria* was empty, and of a more than ordinary ſmallneſs. The *Ventricle* was fill'd only with Wind, like to a blown Bladder.

The *Diaphragm* was ſo forcibly impelled upwards into the Cheſt, that its *Diaſtole* muſt needs be very obſcurely aſſiſtant to *Reſpiration*: It was indeed ſo far Contracted, that its Convex part bore hard againſt the *Lobes* of the *Lungs*, whoſe Subſtance, as I have ſeen in ſome that have dy'd *Tabid*, was very much decay'd and periſh'd, and look'd juſt like Parboil'd Fleſh. In cutting open the *Heart*, I did not perceive the leaſt Drop of Water to fall from it: By which it may be juſtly thought that the *Pericardium*, or *Capſule* of the *Heart*, being altogether deſtitute of its Refrigerating Liquor, clung immediately to the proper Tunick of the *Heart* it ſelf; Upon cutting through whoſe *Ventricles*, we could not perceive one Drop of Blood, no more than in the reſt of the *Bowels*; and the *Liver* it ſelf was deſtitute of ſo much Blood as might be thought neceſſary for its own proper Nouriſhment, and yet its Salino-Sulphureous Particles which conſtitute the *Gall*, were depoſited into the *Veſica Bilaria*, to the Quantity of about a Spoonfull. I obſerv'd a very large Protuberance of the *Coſtæ* and *Sternon*; which perhaps might be occaſion'd from the Rarified Effluvia of the Waters, pent up within the Breaſt, or rather a neceſſary Conſequence of the *Diaphragm*'s being ſo exceſſively Preſſed upwards.

I ſhall not take upon me to determine, Whether the contain'd Liquor happen'd from any Rupture in the *Lacteal* or *Lymphatick Veſſels*, according to Dr. *Willis*, or (as more probable to me) if it were not pure *Serum* (the Blood being diſſolved into its conſtituent parts) breaking forth of the little Mouths of the *Cæliac* and other *Arteries*.

LI. In the Diſſection of Madam *Vaillant* by M. *Du Linier*, the *Liver* was found very White without, but Red enough within; The *Epiploon* extremely dry'd; The *Stomach* much bigger than ordinary; The Winding of the *Colon*,

Obſervations on a Woman who dy'd of a Dropſy, *after the* Paracenteſis; *by Dr.* Ch. Preſton. *n.* 223. *p.* 330.

Colon, which paſſes under the *Stomach*, extremely drawn together by 3 Threads. In the *Umbilical* Region, the Inteſtines *Jejunum* and *Ileon*, much inflam'd, and their Tunicks much more thick than ordinary; In the *Hypogaſtrick* Region, all the Inferior part of the Inteſtine *Ileon*, on that ſide near the *Bladder*, and all the Bottom of the *Matrix*, as alſo the Inferior part of the *Rectum*, much Inflam'd and Ulcerated; In the Bottom of the *Matrix* there was an Abſceſs, and the Internal Orifice extremely Dilated, about the largeneſs of a Crown; The Extremity of the Inferior part of the *Ureter* Cartilaginous; the Extremity of the *Tubæ Fallopianæ* went ſo high as the ſecond *Vertebre* of the *Lumbar* Region; In the Interior part it was Dilated 6 Lines, and near the Bottom of the *Matrix*, about 2 Inches, and was ty'd to all the Inferior part of the *Kidney*; that of the Left-ſide was Dilated about 4 Lines in the Upper part, and 6 in the Inferior. The Right *Teſticle*, or *Ovarium*, which ordinarily does not exceed the bigneſs of a Pidgeon's Egg, was here 3 Inches long and 2 of breadth; and in the Inferior part there was found an Egg, hanging by its Ligament, out of the *Tuba Fallopiana*, about the bigneſs of the Yolk of a common Hen's Egg; which for Experiment I cauſed to be Boiled, and it Harden'd as an ordinary Egg. The Right *Kidney* went up as far as the laſt of the True Ribs, and deſcended below the *Umbilical* Region; the *Pelvis* was Dilated about 3 Inches in Breadth, and 7 in Length. The greateſt part of the Water had run out in the *Operation*.

The *Lungs* were of a Livid Colour, as in all *Chronical* Diſeaſes; and on the Right-ſide were adherent to the Membrane *Pleura*; and on the Left-ſide was an adherence of the Inferior *Lobe* to the *Diaphragm*. In the *Pericard* was little or no *Serum*, and what we found, of a Bloody Colour: In Diſſecting the *Heart*, we found a great *Polypus* in the Right *Ventricle*, taking up almoſt all the Cavity, about 5 or 6 Lines in thickneſs, and half a Foot in Length.

From what has been ſaid, it appears impoſſible that this Patient could have recover'd tho' the *Operation* had not been perform'd; only this is to be remark'd, that where the *Dropſy* is of a long Continuance, and the Perſons much Debilitated, and of Age, in that Caſe the *Operation* ought not to be perform'd, for generally the *Viſcera* are Corrupted. But when you find it convenient to perform this *Operation*, Extract the Water by Degrees, and not all at once, elſe you endanger the Perſon; for ſcarce One eſcapes of a Hundred that is done otherwiſe.

The Cauſe of the Dropſy.

The true Cauſe of the *Dropſy* I take to be from the Mechanick Structure of the Parts, and the Diſpoſition of the Blood; which are firſt the Relaxation of the Fibres, and Pores, of the *Veſſels*, or the *Veſiculæ*, which are between the Arteries and the Veins, or ſecondly a Compreſſion of the *Veſſels*; for the *Lymphaticks* take their origine from the Membranes, which covers the *Muſcles, Viſcera, and Glands*; therefore, when the *Veſiculæ* are too much Straitned with *Seroſity*, their Fibres looſe their natural Force, and become uncapable to expel the too great Quantity of Water; but the *Veſiculæ* are enlarged from day to day, untill their Fibres ſuffer ſo great an Extenſion even as to break, from hence is the Source of thoſe Waters; it happens alſo ſometimes, that the

Pores

Pores of the ſaid *Veſiculæ* are ſo widened, that the *Lymphe* runs into the *Cavity* of the *Belly*, or the Interſtices of the *Muſcles*. The Cauſe from the Diſpoſition of the Blood, is either when it is too Thin, or too Viſcid; too Thin, that it paſſes eaſily through the Pores of the *Veſicules*; too Viſcid, that it cannot paſs through the *Capillary Veſſels*, and by Conſequence compreſſes the adjacent Parts, ſo cauſes *Obſtructions*.

LII. *Pontæus* (the Famous *Mountebank*) ſays that for the *Dropſy*, after all other things, one of the beſt Remedies in the World is to take *Morſus Diaboli* and put it over the Fire in a dry Kettle, that it may wet it only with its own Juice, and of this to apply a Quantity to the Belly and Reins of the Patient, covering him up warm, and ſo provoke Sweat; which will come away in great Quantity, and may be maintained according to the Strength of the Patient, and Exigency of the Caſe.

A Cure for the Dropſy; *by Sr.* Theodore Mayerne. *n.* 211. *p.* 166.

LIII. A Young Gentlewoman, not Married, about 8 Years before her Death found ſome ſmall Pains in the *Lumbal* Regions, and ſometimes made Blackiſh Urine. If ſhe at any time uſed any Motion, the Pain would increaſe; commonly finding moſt Eaſe when her Body was ſedate. In this Indiſpoſition her Phyſicians in the Country preſcribed Aſtringent Medicines. About 2 Years after, the *Lumbal* Pain encreaſt on the Left Side; and a great Weakneſs, Loſs of Appetite, Ill-Digeſtion, followed. Of theſe Indiſpoſitions ſhe recovered again, and was in all appearance Heathfull, and ſo continued near two Years and a half: about which time they returned again, together with Black Urine, and frequent Incitations to Vomit; but of theſe Diſorders ſhe had ſome Intermiſſions, and ſo ſhe continued about 2 Years. About *Chriſtmas* 1695. ſhe began to be afflicted with Violent Pains, and her Urine appeared very Black: Of theſe Extravagant Pains ſhe was much eaſed with the Uſe of common Clyſters, but nevertheleſs continued much indebilitated. The beginning of *May* the Pains increas'd about the Regions of the *Loins* and *Pubes*, and ſhe was once or twice ſurprized with the falling down of a Weight within her, (as ſhe expreſt it.) When thus Tormented ſhe took large Doſes of *Opium*, which did ſomewhat alleviate the extravagancy of Pain. The Ordinary Poſition of the Trunk of her Body was more enclining to be Erect then bending forwards, contrary to what we find in thoſe troubled with the *Stone* in their *Kidneys* or *Ureters*, except thoſe in whom the *Kidneys* is Intumify'd. She complained of a *Stupor* or Numbneſs in the Left Region of the *Loins*, whilſt very acute Pains affected the *Viſcera* of the Lower Belly, eſpecially thoſe placed in the *Hypocondria*. The Pains on her *Pubes* encreas'd near the time of her Death, and a great *Stupor* affected the Left Thigh, which ſhe was ſcarce able to draw after her, much leſs to put forwards, in Walking.

A Large Diſeaſed Kidney; *by Mr.* Will. Cowper. *n.* 222. *p.* 301.

The Day after her Death, I was call'd to Diſſect her Body, which was very much Emaciated. A large *Tumor* appear'd in the Left *Ilia*, extending it ſelf to the Left Part of the *Epigaſtrium*, even to the *Hypocondrium* of that Side. The *Omentum* appeared very thin and Membranous, cleaving to the Left *Kid-*

ney;

ney; which was very much Intumified, and caus'd that appearance of a large *Tumor* before Diſſection. This *Kidney* had taken place of the *Spleen*, and touched the Bottom of the *Stomach*, and in ſuch manner preſt one part of the *Colon* as very much leſſened the Diameter of that Gut. The *Stomach* and *Small Guts* were ſomewhat diſtended with Wind; the former appeared very looſe, as if its proper Tone was much Relaxt. The *Pancreas* appeared a little Indurated. The Left *Spermatick Vein* was very much extended, between the *Kidney* and the *Ovarium*; the upper part of that *Vein* being compreſt by the ſuperincumbency of the lower part of that *Kidney*; inſomuch that the Trunk of this *Spermatick Vein* was very much Leſſened, immediately before it enters into the Left *Emulgent Vein*. In freeing this Diſeaſed *Kidney* from its many Adheſions to the Neighbouring Parts, its outward Membrane happened to burſt in two or 3 places, whence iſſued a large Quantity of Grumous Blood. This *Kidney* weighed 5 Pounds, and the other but 5 Ounces, which was of a common Size, and no ways diſordered. By the Diſtenſion of the Membranous parts of the *Kidney* *Fig.* 31. it ſelf, its Veins were in a great meaſure Compreſt. Its *Ureter F F*, was large through the Intumeſcence, or thickning of its ſides, whereby its Cavity was ſtreightned. In a Diviſion made by cutting into the Body of this ſwelled *Kidney*, its inſide appear'd like that of a *Schirrus* or Boil'd *Liver*. I found 2 or 3 large Cells *B*, fill'd with Grumous Blood, which proceeded from an Eruption of ſome Blood-Veſſels before Death, which I am apt to think might Alarum the Patient with the Apprehenſions of ſome Weight falling down (as ſhe expreſt it.) In the *Vagina Uteri*, near the *Meatus Urinarius* was an Ulcerous Appearance, attended with a Mortification. The Left *Pſoas* Muſcle was very much Leſſen'd by the Compreſſion of the lower part of that *Kidney*; and the *Nerves*, diſtributed to ſome parts of the Thigh, which paſs through that Muſcle, were expoſed to view.

A Polypus in the Heart. Nothing diſordered appeared in the *Thorax*, but what is commonly obſerved after Death in all *Chronical* Diſeaſes, *viz.* a *Polypus* in each *Ventricle* of the *Heart*, and great Blood-Veſſels; of which I have commonly obſerved the Right *Ventricle*, and the Veins, to be furniſhed with the largeſt *Polypus's*, eſpecially the *Vena Cava* and Right *Auricle*; the latter of which I very lately found compleatly Diſtended with a *Polypus*, or Coagulation of *Serum* in the Body of a Boy who dy'd with a *Hydrops Thoracis*; in which Caſe, the Symptoms of Sighing and Difficulty of Inſpiration I have always found remarkable. I can't but think the ſlow return of the Blood by the Veins, is the immediate Cauſe of the Coagulation of the Serous part of the Blood, which frames theſe Bodies, which from the Figure (which they acquire from the Parts they are lodg'd in) are call'd *Polypi*. Hence it is the *Syſtole* of the *Heart* prevents their being framed ſo large in the Left *Ventricle* and Arteries, as in the Right and the Veins; the Blood being carry'd through the Former with much greater Force than the Latter.

Blackiſh Urine, I believe, is commonly obſerv'd in many *Feveriſh* Indiſpoſitions; where the Blood is either partially obſtructed in its return by the Veins of the *Kidneys*, or through its great Velocity in paſſing the *Kidneys*; where

when ſome part of the Globules of the Blood alſo paſs out at the *Urinary Pores* in the ſides of the Blood-Veſſels, and thoſe Globules being broken exhibit thoſe Blackiſh Bodies, which appear in the Sediment of the Urine. In theſe Caſes the *Serum* of the Blood paſſes off with the Urine; for by Evaporating ſuch Urine by Heat, as in a Spoon over a Candle, it will Lacteſce and become Thick like the true *Serum* of the Blood.

Obſtructions commonly begin in the moſt *Capillary Veſſels* firſt; as I have frequently obſerved in viewing the Tranſparent Finns of divers living Fiſhes with my *Microſcope*: And tho' it has been hitherto commonly ſuppoſed, that Veins and Arteries are all equally leſſened at their Extremities, yet I am of Opinion, (and I believe can give Ocular Demonſtration of it too) that the Extremities of divers Blood Veſſels, are much larger than their Companions. Hence an account may be given of the partial Circulation of the Blood, and yet Mortifications not neceſſarily ſucceed, as in the preſent Caſe: For the *Kidney* here being vaſtly extended, which proceeded from a Retardation of the Refluent Blood and *Lympha*, it is conceivable that the Obſtructions began in the Membranes, which compoſe the Parities of the Trunks of the Veins and *Lymphe-Ducts*, whence an Intumeſcence neceſſarily follows; and the Cavities of thoſe Veſſels are leſſen'd, conſequently the Refluent Blood or *Lymphe* not being duly diſcharg'd, thoſe larger Veſſels are neceſſarily diſtended between their Intumefied Sides with compreſt Cavities, and their Extremities at the Arteries. Thus we may apprehend how a Part remains Intumefied, under a partial Circulation, and may (when no ill Juices are joyn'd with the Blood and *Lymphe*) continue ſo for ſome Months, nay Years, as in the preſent Caſe, without any Diſorder to the Patient; but on ſuch Motions of the Body, as accelerate the Motions of the Blood, at the Extremities of the Veſſels, when there is a greater Quantity of Blood imported than can be diſcharg'd by the Veins; whence a ſudden Intumeſcence ariſes, and Pains neceſſarily follow. What Aſtringent Medicines avail, in ſuch like Caſes, is difficult to conceive; but Aperitives might be ſerviceable. Loſs of Appetite, Ill Digeſtion, *&c.* attend *Nephritical* Caſes, by the Nervous Communications of thoſe of the *Kidney* with the *Stomach*, *&c.* whence the *Tone* of that *Part*, as well as the *Inteſtines*, eſpecially the *Colon*, becomes vitiated, and ſubject to frequent Diſorders, eſpecially Vomiting and *Cholick* Pains. By *Tone* of that *Part*, I mean, that proper Diſtribution of the *Nervous* Ramifications within the Part when Extended, as in this Caſe, and *Inteſtinal* Ruptures, (as they are call'd) and the like: Or when the *Nervous* Ramifications are Relaxt, as in *Paralitical* Caſes, *&c.* the *Tone* of the *Part* neceſſarily becomes Vitiated, in as much as its *Nervous* Diſtributions are diſordered. The Contents of the *Stomach* and *Guts* not being duly carry'd on, are apt to Ferment; the contain'd Air being Rarified by the Natural Heat, the *Inteſtines* or *Stomach* (not being able to reſiſt the Enlargment of that Rarified Air) gives way, and becomes very much diſtended; whence *Cholick* Pains, and Diſturbances in theſe Parts ſometimes ariſe, as I am apt to think in theſe Caſes. Hence by procuring the Evacuation of this contained Wind, the Afflicted are eaſed, as by giving of *Cly-*

ſters,

ſters, &c. To diſcover the Operation of *Opium*, and how it procures Eaſe in this and ſuch like Caſes, I examined a Solution of *Opium* with my *Microſcope*; the Particles of the Diſſolv'd *Opium* appear'd like fring'd Globules. Theſe Particles we were inclin'd to think (if ſo convey'd to the Maſs of Blood) might ſo intangle in its *Serum*, and thicken it, as to occaſion a Retardation of the Globules of the Blood, and hinder their progreſſive Motion, at the Extremities of the Blood-Veſſels: Hence the Blood not paſſing with its wonted Velocity, does not ſo ſuddenly extend thoſe enlarged Veſſels, which have a conſiderable ſhare in the Intumeſcence of the Part; but by making the Globules of the Blood paſs more calmly, might prevent their ſudden Efforts, or Intruſions into thoſe diſtended Veſſels.

The Intumefied *Kidney* not only compreſt the Left *Spermatick* Vein, whereby the Refluent Blood of the *Uterus*, *Vagina*, and Parts adjacent, was in ſome meaſure retarded, but ſome of the Nerves of the *Vagina*, and thoſe of the *Pudendum*, were alſo Compreſt thereby: hence Pain ariſing from Inflammation, thro' a retardation of the Blood at the Extremities of the vaſt Number of Blood Veſſels, about the *Meatus Urinarius*, at its Egreſs in the *Vagina*; whence Exulceration and Mortification followed. The Magnitude of this *Kidney* prevented the Bending Forwards of the Trunk of the Body: whence it was ſhe was oblig'd to keep it Erect. The lower part of the Left *Kidney* had ſo Preſt on the Left *Muſculus Pſoas*, as ſcarce a 3d part of its proper Bulk remain'd: Whence neceſſarily follow'd a great Indebilitation in the drawing the Thigh forwards. She had a great *Stupor* in that Thigh, through a Compreſſion of the *Lumbal* Nerves, which lay expos'd immediately under the Intumefied *Kidney*.

I am apt to think, that Caſes like this are often taken to proceed from Stones in the *Kidneys*, or *Ureters*: But I conceive, that unuſual Poſture, of keeping the Body Erect, may diſtinguiſh it; together with an Indebilitation of drawing the Thigh, and Leg forwards. If theſe Symptoms do not conjunctly occur, yet by this we may be admoniſht, that *Nephritical* Diſorders are not, as is commonly thought, owing to *Stones*, whether in the *Kidneys* or *Ureters*.

Explanation of the Figure.

Fig. 31.

A, The upper part of the *Kidney*, which touched the Bottom of the *Stomach* and *Spleen*. *B*, The lower part, conſiſting of divers Protuberances; the Inſides of which were diſtended with Extravaſated Blood. *C C*, The *Blood-Veſſels* of the proper Membrane of the *Kidney* diſtended. *D*, The *Fat* placed at the entrance of the *Veſſels* into the *Kidney*. *E E*, The *Emulgent* Arteries and Veins cut off. *F F*, The *Ureter* very much thickned in its ſides, and cleaving to the lower part of the *Kidney*.

Four Ureters in an Infant; by Dr. Edw. Tyſon. *n.* 142. *p.* 1039. *Fig.* 32, 33.

LIV. *May* 23. 1679. Upon the opening an Infant, I found the *Ureters* double to both *Kidneys*; their Origination from the *Kidneys* being at ſome diſtance from each other, but afterwards both of the ſame Side were inclos'd in a *Capſula*, or Membrane, even to the *Bladder*, where thoſe of the Right Side were inſerted ſeverally, yet neareach other; but on the Left they ſeemed to enter at the ſame Orifice.

I have given a *Cut* of the Right *Kidney* and of both the *Glandulæ Renales*, as well to ſhew their juſt Magnitude and Figure (as they appear'd in this Body) as alſo their Proportion to each other. As far as I have hitherto obſerved, the *Glandulæ Renales* in *Embryo's* and Infants are greater, at leaſt proportionably, than in *Adultis*. They have a large Cavity, which by blowing into them I found emptied themſelves into two Veins; whereof the Right immediately paſſed into the *Vena Cava*, the Left into the *Emulgent*. Beſides theſe, they had other leſſer ones from the Neighbouring Veſſels.

The Glandulæ Renales.

Fig. 34.

Fig. 32. *A*, The Right *Kidney*, whoſe Superfice ſeem'd to be variouſly divided. *B*, The *Emulgent Vein*. *C*, The *Emulgent Artery*. *d d*, Two *Ureters* belonging to this *Kidney*.

Explication of the Figures.

Fig. 33. Repreſents the two *Ureters* of the Left *Kidney*, which a little below the *Kidney* are both enclos'd in a common *Capſula*, or Caſe, and ſo continu'd to the *Bladder*.

Fig. 34. The *Glandula Renalis* of the Right Side. *B*, That of the Left. *C*, The *Vena Cava*. *d*, A Vein, or *Ductus*, opening from the Cavity of this Gland, and entering the *Vena Cava*. *e*, A Vein from the Left *Glandula Renalis*, and is inſerted into a Branch of the Left *Emulgent*.

LV. I made a Dog drink a good Quantity of Water, and thereupon caus'd his *Ureters* to be well ty'd about, and Empty'd his *Bladder*. After two Hours I found the *Bladder* Empty, and the *Ureters* were not Tumid above the Ligature. Being ſurpriz'd thereat, I believ'd, that the Cauſe might be the too much cooling of the Inward Parts, that had all this while been expos'd to the open Air. To avoid this Inconvenience, I caus'd a ſmall opening to be made on each ſide another Dog, ſufficient to find and to tye the *Ureters*, and to ſqueeze the *Urine* out of the *Bladder*, by preſſing it with one's Hand. This done, I made theſe Openings to be ſow'd up again; and then having made the Dog drink good ſtore of Water, I left him for near 3 Hours in the leaſt Violent Poſture that his Ligatures would permit. Afterwards having open'd both the Holes, and the *Bladder* being preſſed with the Hand, there iſſued out of it a pretty Quantity of *Urine*, and the *Ureters* ſeem'd to be a little ſwell'd above the Ligature.

A Paſſage of Urine to the Bladder, diſtinct from the Ureters; by M. ..... n. 65. p. 2084. n. 67. p. 2049.

LVI. On the Diſſection of Mr. *Smith* of *Highgate*, *Jul.* 8. 1687. we diſcover'd the *Bladder* very *Schirrous*, and $\frac{1}{4}$ of an Inch thick, of a preternatural Figure, and Diſtended to the bigneſs of a Child's Head: and at the Entrance of the *Ureters* on each ſide were two Protuberances, of the bigneſs of a Hen's Egg each. The *Ureters* were of the largeneſs of the Small Guts in Children, ſo that they could eaſily admit two Fingers into their Cavity. They were both repleat with *Urine*, or a Serous Matter; which upon preſſure did eaſily Regurgitate into the *Kidneys*, but would not paſs at all into the *Bladder*. The *Kidneys* were of their Natural Bigneſs and Figure, but ſo Emaciated that they were rather large Bags, than of a Fleſhy Subſtance; The

A Schirrous Bladder, containing in it Bags of Serous Matter, by Dr. Edward Tyſon. n. 188. p. 332.

Cavity of the *Pelvis* being ſo large as to contain above 3 Ounces of Water. In the *Bladder*, we found a very ſtrange ſort of *Cyſtes* or Bags, of the exact Figure of Eggs, of ſeveral Dimenſions, ſome larger than Gooſe Eggs, others as big as Hen-Eggs, to the number of 12 in all; and about 8 of them whole, and repleat with a *Limpid Serum*. The Coats of theſe *Bladders* were ſome of them conſiderably thick, others very thin and tender; all of them looſe and free without the leaſt Adheſion, either to one another or to the Coat of the *Bladder*. There was little or no *Urine* in the *Bladder*, but what was contain'd in theſe *Bags*. Nor could we imagine that this miſerable Patient could poſſibly make any Water, but what happen'd upon the Breach of ſome of theſe Watry Tumours, when the *Bladder* was crouded beyond its Dimenſions; for that the Paſſage by the *Ureters* into the *Bladder* was Impervious.

The Liquor cotain'd in theſe Bags, we did conjecture to be of the Nutritious Juice of the Body, and upon tryal of Boiling a ſmall Quantity of it, we found it to Thicken, and come to the Conſiſtence of a Stiff and Glutinous Gelly. Theſe *Veſiculæ* were undoubtedly form'd from the Tenacity of the Matter between the Membranes of the *Bladder*, in its oblique paſſage through them; for that, being ſo Glutinous, it was here detain'd till its Superficies were condens'd into a Firm Coat, and ſo by the coming of more Matter was forc'd into the Cavity of the *Bladder*. This, I ſuppoſe, from our finding two of theſe *Ova* in a diſtinct *Sinus* from the reſt, between the Coats of the *Bladder*, at the entrance of each *Ureter*.

The *Liver* we found very large and hard, of the Colour and Subſtance of a boyl'd one. It adhered to the *Peritonæum* on the external part, and by its vaſt bigneſs had ſo ſtraitned the *Thorax*, that there was very little room for the *Lungs*. The *Lungs* we found of a Livid Colour, adhering cloſe to the *Pleura* on the Right Side; upon Inciſion we found them wholly repleat with a Purulent Matter, and a *Stone*, of the bigneſs of a Cherry-ſtone, in one *Lobe*. Dividing the *Pericardium*, we found a Fungous Subſtance covering the *Heart* all over, and Fibres from it, that ran to the *Pericardium* in a great number, ſo that they were by theſe Fibres every where United. The *Heart* was very large, the Right *Auricle* and *Ventricle* were one large undivided Cavity, and therein a large *Polypus*; which run up the *Deſcending* Branch of the *Vena Cava* to the very *Jugular*, another part being diſtributed to the *Pulmonary Artery*. In the Left *Ventricle* was another *Polypus*, not ſo large as the former; it had two Branches, one in the *Pulmonary Vein*, another in the *Arteria Magna*, or *Aorta*. One of the *Veſiculæ* being open'd had a large Cluſter of ſmall *Ova* as big as Grapes, all repleat with Liquor; all the reſt contain'd nothing but *Serum*.

Suppreſſions of Urine (not caus'd by a Stone) Cur'd with Acids; by Dr. Edw. Baynard, n. 215. p. 20.

LVII. A Servant of Mr. *Baniſter*'s had labour'd for 7 or 8 Days under a total *Suppreſſion* of *Urine*. Mr. *Ch. Bernard* try'd his *Catheter*, but found not the leaſt appearance of any *Stone* there, nor a Drop of Water in his *Bladder*. Whereupon Dr. *Baynard*, ſuppoſing that it might be the ſame Caſe of which that moſt Learned Prelate Dr. *Wilkins*, late Biſhop of *Cheſter*, Dy'd,

caus'd

caus'd the Patient to take a Quantity of *Acids* in a convenient Vehicle; upon which, Secretion being presently made, he immediately *Urined* in great Quantity, and was thereby restor'd to his Health.

A *Member* of *Parliament*, being found in the like Condition, was by the Use of *Acids* restor'd to his Health. And in several Cases since, he has found it to answer with great Success.

In another like *Suppression* of *Urine*, and after many Medicines given in vain, Mr. *Banister* propos'd Dr. *Baynard*'s Method, which caus'd the Patient to *Urine* presently.

LVIII. A Stone was taken out of the Womb of a Woman, near *Trent* in *Somersetshire*, by Incision, in *Easter* 1666. I have seen the Stone, and weigh'd it in Gold Scales, where it wanted somewhat of 4 Ounces; but it had lost of the Weight it formerly had, being now very light for a Stone of that Bulk. It is of a Whitish Colour, lighter than Ash colour; it had no deep Asperities; and had somewhat of an Oval Figure, but less at one End than a Hen-Egg, and bigger and blunter at the other End than a Goose-Egg.

A Stone taken from a Woman; by Dr. Beale. n. 18. p. 320.

LIX. 1. Mr. *Goodrick* (a Chyrurgion of *Bury St. Edmunds*) affirm'd to me, that himself cutting a Lad of the *Stone*, took out thence, at one time, 96 Small *Stones*, all of them of unlike Shape, Size, Corners, Sides; some of which were so bestow'd as to slide upon others, and had thereby worn their Flats to a wonderfull Slickness. He assur'd me also, that in the same Place, another when Dead had a *Stone* taken from him, almost as big as a New-born Child's Head, and much of that Shape.

Many Stones taken from one Bladder; by Dr. Nath. Fairfax. n. 26. p. 482.

2. M. *Jo. Braun* of *Dantzick*, a Gentleman of 71 Years of Age, being Dead, I Open'd his Body to find the Cause of the excessive Pains, he had endured for two Years and a half in his *Penis*, with a continual Cutting, Burning, and Pressing, of his *Urine*, coming from him Dropwise; until at last it came to a constant endeavour of going to Stool and of making Water, which a few Weeks before his Death ended in a continual Running of *Urine* with very sharp Pain; after which, about 4 Days before his Death, to my Knowledge, the Water was totally stopp'd. We found the *Bladder* quite full of *Stones*, of which the biggest was of the bigness of a Pidgeon's-Egg, and somewhat larger. Of the bigger sort there were 16, yet differing in Size. The rest were very small, to the Number of 22. We found not a Drop of *Urine* in the *Bladder*, but it had already made, on the side of the Orifice of the *Bladder*, an opening of a considerable bigness; upon which Death necessarily ensued. In the *Kidneys*, and *Ureters*, there could not be found the least Grain or mark of *Sand*.

By M. Caspar. Wendland. n. 99. p. 6156.

3. Several of the lesser sort of these *Stones* were Triangular and Quadrangular; their Flats worn to a great Smoothness, and their Corners blunted. The greatest *Stone* weigh'd 206 *Gr.* the least 3 *Gr.* all the 38 weigh'd $4\frac{1}{8}$ *Ounces*. The Matter of the *Stones* is exceeding compact, and like white Clay;

By Mr. Chr. Kirkby. ib. p. 6155.

Clay; and though the ſeveral Coats may be diſcern'd in one of them which I broke, yet they are not eaſily ſeparable.

Stones in the Kidneys; by M. Chr. Kirkby. n. 71. p. 2158.

LX. A Woman near *Dantzick*, of 56 Years of Age, unmarried, whoſe whole courſe of Life had been extreamly ſedentary, was troubled, ſome Years before her Death, with great Pains in her Back, eſpecially towards her Right Side, and a continual Inclination to, and effective Vomiting; whoſe *Urine*, for ſome time before, was Turbid and as it were mingled with Blood; yet totally void of Salſuginous Matter. Her Phyſicians adjudged that Symptom of bloody Water to have proceeded, *ex præmatura Ceſſatione Menſium* (which left her in the 40th Year of her Age;) thereby perhaps deceived, becauſe there was never either *Stone* or *Gravel* voided by her. But her laſt Doctor (from whom I have this Relation,) adjudged it to proceed *ab Affectu* Nephritico *& quidem graviſſimo.* When ſhe was opened he found the Left *Kidney* filled with large *Stones*, but the Right wholly Petrify'd, covered with the ordinary Skin without any Fleſh; It was both Maſſy and Ponderous, ſo concreted by the cloſe Coalition of minute *Sand*, which might be rubb'd off by your Finger.

Large Stones voided by a Woman: by Dr. Geo. Garden. n. 134. p. 843.

LXI. A Poor Woman near *Aberdeen*, who hath been of a long time ſadly afflicted with the *Gravel*, hath lately paſſed 4 *Stones* of an unuſual bigneſs; of which I have one by me, which, though it be not the greateſt of the 4, is yet more than 5 Inches about the one way, and 4 the other: They are all Oval; the firſt, and part of the 2d, were ſmooth; but the other two very *Rough*; and the laſt, the biggeſt, which being come away about *Chriſtmas* 1676. was Bloody on one ſide when I ſaw it.

A Stone of 32 Ounces.

A *Stone* was alſo found, the ſame Year, in a Gentleman's *Bladder* in this Country after his Deceaſe, weighing 32 *Ounces*.

Two large and oddly ſhaped Stones in the Kidneys; by Dr. Fred. Slare. n. 157. p. 534.

Fig. 35.

LXII. 1. I here give you the *Figure* of a *Stone*, ſomewhat reſembling the *Kidney*; for that was quite worn away, and this *Stone* fill'd up the place. It weigh'd, when I took it out of the Body, $7\frac{1}{2}$ *Ounces*; but not ſo much now. I meaſur'd 7 Inches upon the round. I find it conſiſts of ſeveral *Laminæ* laid over one another, as that of the *Bladder* does.

2. I had leave of Sir *Theodore de Vaux* to take the *Figure* of that *Stone* which was taken out of the Body of the late Duke of *Norfolk*'s Father. It ſeems to have ſpread ſome of its Branches into the great Veſſels. It weighs $4\frac{1}{2}$ *Ounces:* and meaſures longwiſe, from one extream to the other, 4 Inches compleat, and the Extenſion of the Branches from one to the other, meaſured croſſwiſe or tranſverſly, $3\frac{1}{2}$ Inches.

Fig. 36.

A very great Stone of the Bladder; by..... n. 171. p. 1015.

LXIII. This *Stone* was taken out of the Bladder, of one *Fr. Dugood* of *Auchenhove* in *Aberdeen*. The Man, who bred it, Lived till he was 50 Years Old. The Length of it is $5\frac{9}{10}$ Inches, the Diameter, $3\frac{6}{10}$; the Weight, 2 Pound 3 Ounces, and 6 Drams.

LXIV.

LXIV. Two *Stones* of the ſhape and bigneſs of the *Figures*, were voided by the *Penis*, without any conſiderable Pain, by a Perſon about *Leiceſter* 1684. The Perſon that voided them told me, he was for many Years ſubject to great Pain, firſt in the *Kidneys*, and afterwards in the *Bladder* when that in the *Kidneys* ceaſed. But after their Excluſion he was free from Pain.

Stones voided per Penem; by Dr. Cole. n. 175. p. 1162.

Fig. 37, 38.

LXV. A Stone came from the Bladder of a Gentlewoman of *Wallingford*, at the Age of 63 Years. The Compaſs of it was $5\frac{1}{2}$ Inches; the Length $4\frac{3}{4}$ Inches; the Weight 3 Ounces *Avoird.* This Stone was at its coming off, taken out by her Husband, without the help or Inſtrument of Phyſician or Chirurgeon, and without Effuſion of Blood; ſince its coming off, ſhe has been troubled with *Urinæ Incontinentia.*

A large Stone voided by a Woman; by..... n. 178. p. 1271.

LXVI. Mrs. *Margaret Plunket* of *Dublin*, *May* 29, 1691. voided through her *Urinary Paſſage*, by the help of Nature alone without the Uſe of Remedies, or any forcible means whatever, a *Stone* ſomewhat reſembling a hard Pear a little Preſt or Flatted. Its Circumference meaſured, the longeſt way, $7\frac{3}{10}$ Inches; round about, where it was largeſt, $5\frac{3}{4}$ Inches; its Weight at preſent, according to *Troy* Pound ℥ij, ʒij, ℈j, *gr.* 6. It has loſt conſiderably both of its firſt Bulk and Weight, by many little Fragments breaking off from the ſmaller end *A*, where 'tis much Softer, Smoother, Whiter, its parts more Porous, and ſo Incoherent that the leaſt Force ſevers them: Whereas the bigger end *B*, as far as the Stroke *c c c*, is of a very different Texture, much more Cloſe and Compact, cover'd with a yellowiſh ſhining Cruſt, Rough, Granulated, and as Hard as the beſt *Portland* Stone. For theſe 3 Months paſt, whilſt 'twas ſticking in the *Urinary Paſſage*, and coming away, ſhe has ſuffer'd great Pains, and a perpetual *Strangury*, or an involuntary dropping of her Water from her; and this Infirmity ſtill continues, by reaſon the largeneſs of the *Stone* has overſtretch'd the Fibres that compoſe the *Sphincter* of the *Bladder* in its Paſſage through it, whence their Tone is ſo relaxt that they have loſt all Power of Retention; and for this Reaſon, I find all Women that void *Stones* this Way, of any conſiderable bigneſs, are conſtantly attended with this Weakneſs. But ſince the *Stone* came away, her Pains are ſo abated that ſhe can walk about.

A large Stone voided by a Woman; by Dr. Tho. Molineux. n. 202. p. 818.

Fig. 39.

LXVII. Generoſa quædam Annorum 31, Anorexiâ ac *Ventriculi* Dyſcraſiâ diù laboraverat, ut vel parùm appeteret, & ne quicquam deglutire poſſet quod non ſtatim evomuit, cum copioſa Æruginoſæ Bilis per Alvum dejectione. Ad hanc accitus multa adhibui Remedia *Ventriculi* Viſcerumque Tono labefacto appropriatiſſima, undè aliquandiù melius ſe habebat, ut per aliquot Menſes quotidiè in apricum prodiret. Verum in herba latebat Anguis qui ipſam Mordicus tenebat miſeram, ut in dicta Symptomata recidivationem pateretur, & Morbus nullis Medicamentis eſſet emendandus. Obſervavi enim prædicta Symptomata a *Calculo* in *Rene* Siniſtro hoſpitante proceſſiſſe. Ipſi tandem Menſe *Julii* Aquas *Epſamenſes* acidulas vehementer appetenti, & tunc temporis

An extraordinary Stone in the Kidney; by Dr. Rob. Witty. n. 207. p. 30.

temporis Tertianâ Nothâ insuper detentæ, suadebam, ut Aerem istum purum aliquandiù inspiraret, ac Septimanas aliquot hilariter transigeret inter Hydroporas; Liquore vero ut parcius biberet, nè indè *Calculosa* Symptomata magis irritarentur. Post duos Menses reversæ omne vergebat in deterius, ut nec quovis *Cardiaco* per vices, nec Cibo retineretur, nec in utrumvis Latus præ Dolore decumbere posset. Ipsâ tandem, inter Mulieres Optima, innumeris pressa Symptomatis, Animam in Salvatoris Sinum placidissimè expiravit, 28 *Jan.* $16\frac{79}{80}$.

Die sequenti, Cadaver aperuimus. *Pulmones* male colorati, ac dextram versus computruisse videbantur, ut *Phthiseos* impendentis (si diutiùs vixisset) metum incuterent. *Ventriculus* ultra modum distentus, ac adinstar *Vesicæ* inflatæ tumefactus, proxime emicuit, ut vel indè ob tenuitatem, ac Fibrarum solutionem, Tonus ejus necessariò debilitaretur, & ingesta vel statim Vomitione rejicerentur, vel in Alvum cruda sponte defluerent. *Corculum* admodum exile, ac instar vacuæ Crumenæ molle deindè conspeximus, cujus Parenchyma, diuturniori Febris supra-dictæ atque *Hectices* inde sequentis Calore, in Liquore proprio eliquatum, mollitiem contraxerat: Et quidem indè factum est, ut Pulsum constanter haberet undulantem, ut versus finem vix sentiri posset, quin ἀσφυξία detineretur. *Jecur* quidem sat sanum, at supra modum extitit largum, quod non solum Dextrum pro Naturæ Instituto occupaverat, sed ad Sinistrum Latus mirificè extendebatur, atque illud etiam implebat, ut *Lienem* inde depauperatum censeremus, qui parvus plus justo fuit & exilis. Et quidem *Jecur* utrinque (nempe tam in Sinistro quam Dextro Latere) adeò pertinaciter per totum adhærebat, præcipuè in Dextro, ut à Chirurgo non sine vi ac difficultate divelli posset. Et quidem hinc evenerat ut per aliquot Menses in Latera dormire nequiret, nedum sine Dolore in utrumvis inclinare; quin *Hepar* justo gravius *Peritonæum*, Membranam sensûs exquisitissimi, dolorosè distenderet, & *Ventriculus* preter modum debilis ad Vomitionem à Compressione stimularetur. In concavâ utriusque *Hepatis* parte (si ita mihi loqui liceat, cum revera unicum tantum esset in utrumque Latus protensum) delituit *Vesicula Fellea*, ita ut plane duæ extiterint, à seinvicem per Longitudinem Manus meæ ad minimum distinctæ, *Bile* turgidulæ; quæ vero ad lævum *Hepar* adnascebatur, alterâ minor erat, & quidem nigrior.

Ad *Renes* tandem deventum est, quorum Dexter scopo Naturæ ordinario in unaquâque re conformis erat; neque in ea Regione (quantum novi) de minimo Symptomate quærebatur Ægra. In Sinistro autem, ubi Morbi Fomitem, Mortisque Causam inesse semper dixeram, *Calculum* non admodum gravem quidem, aut ponderosum, (cum Semiunciam non excederet) sed miro modo tortuosum evulsimus, ceu Creta albidum, ac instar Radicis alicujus in tres Surculos medio connexos divaricatum ad Latitudinem trium Digitorum. Eheu! Quantos Dolores isti Mulierum optimæ ipsa *Calculi* Figura peperat, quæ tripici Cuspide *Renem* compresserat, ut in formam sui similem distorqueretur *Parenchyma*.

LXVIII. In *Sept.* 1695. I was carry'd to one Mr. *Blondel*, who was lately recover'd from a Feveriſh Indiſpoſition. He complain'd of a very hard Swelling, a little behind the *Scrotum*, which had remain'd there many Years, and created great Uneaſineſs to him. Upon examining it with my Fingers, I immediately declar'd it to be a *Stone* of a very odd and irregular Figure. He had about 20 Years before, while a Lad, been Cut by Mr. *Hollier* for the *Stone* of the *Bladder*; and he had not long recover'd from under Mr. *Hollier*'s Care, before he began to complain of Pain, which reſembled his old Pain of the *Stone*; and this continu'd upon him for 4 or 5 Years, before he was ſenſible of any Fulneſs or Swelling in *Perinæo*, which you are to ſuppoſe at firſt but ſmall. I am inclin'd to believe that Mr. *Hollier* left either a couple of little *Stones*, or pieces of *Stone*, at the time of Extraction, which were by Degrees protruded into the *Urethra*; but being too big to be voided, there lodg'd themſelves, and ſo by perpetual accretion, arriv'd to that Magnitude which you ſee. He conſtantly complain'd of Pain in making Water, which ordinarily flow'd *Guttatim*, and involuntarily, for ſeveral Years paſt. Nor was he longer at Eaſe, than while his *Bladder* was full and diſtended with Urine; which Diſtention was continu'd all along the Neck and the *Urethra*, as far as where the *Stones* were Bedded; for his only way of procuring eaſe to himſelf, was by frequent drinking very large quantities of ſmall Beer or Water, and as ſoon as the ſeparation could be made of the Urine into the *Bladder*, and while that continued full, he was ſenſible of ſome eaſe. He has been likewiſe exceeding liable to Vomiting of late, and generally moleſted with a *Diarrhæa* for ſome Years paſt; both which had lately ſo increas'd upon him, as very much to have impair'd his Health, and weaken'd his Conſtitution.

Two Stones lodg'd 20 Years in the Meatus Urinarius; *by Mr.* Ch. Bernard. *n.* 220. *p.* 250.

After the Evacuations that are proper to precede ſuch an Operation, I Cut upon the moſt protuberant part of the *Stone*, (which I then ſuppos'd to be but one) and making my Inciſion pretty large, the upper part, which prov'd a diſtinct *Stone*, and had form'd it ſelf a Socket in the lowermoſt, ſlipt out with little or no difficulty; the other which was forked, and was as it were bound in, as if it had adhered to the *Urethra*, was remov'd with more trouble, and broke in the taking out, they being neither of them very hard. To facilitate the removal of this *Stone*, I put two of my Fingers up his Fundament, to ſecure it from retiring towards his *Bladder*, and to my ſurprize I found, that one of the Angles of it had perforated into the *Anus*. There was not an Ounce of Blood loſt in the Operation; the *Stones* having lodg'd long there, you muſt imagine had made a very great Diſtention of the *Urethra*, ſo that it was become ſo Callous that I ſeem'd to cut through a Cartilage.

A, The Point which tended towards the *Glans*. *B*, That part which lay in the *Acetabulum*. *C*, The part upon which I made Inciſion. *D*, The *Acetabulum*. *E*, The Point which lay towards the *Neck* of the *Bladder*. *F*, That which had Perforated into the *Anus*. *Fig.* 40.

A Prodigious Stone in the Bladder; by Dr. Ch. Preſton. *n.* 222. *p.* 310.

LXIX. In the Hoſpital at *Paris* call'd *L' Hoſpital de la Charité*, there is preſerv'd a *Stone* of a prodigious bigneſs, weighing about 51 Ounces. It was taken from one of the Religious Brothers in *June* 1690. but he dy'd in the Operation.

A Stone Cut from the Bladder which Adhered to it; by Dr. Ch. Preſton. *Ib.*

LXX. In *June* 1696. while I was at *Ghent*, M. *Parfaima* Lithotomiſt found a *Stone* Adherent to the Bottom of the *Bladder*. When he made the Operation he could not extract the *Stone*, ſo that he was oblig'd to leave his Patient in that Caſe; there follow'd an Impoſthume, and 8 Days after, he Extracted it with great eaſe. The next Day he ſhew'd me the *Stone*, to which the Fibres by which it was ty'd were yet adherent, and could eaſily be obſerv'd by the naked Eye, without the help of a *Microſcope*, ſo that I could not queſtion any thing as to the matter of Fact.

Several Stones voided by a Boy in Scotland; *by Sir* Rob. Sibbald. *n.* 242. *p.* 264.

LXXI. 1. In *May* 1698. a Boy, in the 13th Year of his Age, had the Misfortune to fall backwards with his Head upon a Stone, and lay $\frac{1}{4}$ of an Hour without Senſe. The next Day he Vomited ſome Blood; felt a Pain and Weight in the hinder part of his Head and Neck; and loſt Appetite. Above a Fortnight after, as he was coming out of the Country, he had a frequent deſire to Piſs, and lighted from the Horſe ſeveral times, but could make no *Urine*; he Vomited in this time; the Suppreſſion had continu'd more than 24 Hours, when I came to viſit him. He had a great Pain in his Head, a Pain in his Back and Groins, and in the Region of the *Bladder*, which was Swell'd, and he could not ſuffer it to be touch'd. I caus'd ſome mild Diureticks to be given to him preſently, and anointed his Groins and the *Regio Pubis* with the uſual Ointment, and caus'd a Clyſter to be injected; upon which, that Night he paſſed firſt ſome *Sand*, and then ſome *Urine* by Spoonfuls: I caus'd him afterwards to be put in an half Bath of Appropriate Simples. He was the Days following let Blood and Purg'd; and becauſe the Pain and Weight in his Head troubled him much, a large Veſicatory was apply'd to the *Nucha*, which diſcharg'd much Humour from it. While this was a doing, he paſs'd very much *Sand* of a Greyiſh and Whitiſh Colour; and after the firſt Purge, began to paſs *Stones* by the Yard of a conſiderable bigneſs, with Pain in the Back ſome time before they fell down, then in the Groins, or along the *Ureters*, and moſt in the Right-Side, yet ſometimes in the Left alſo. He found the Yard much dilated while they paſs'd ir, and he had a ſmarting Pain then and while the *Urine* flow'd; the *Stones* came in with the firſt of the *Urine*: He got ſeveral Emulſions which had good Effect. Some of the *Stones* were Round, ſome Oval, ſome Triangular, ſome of a Pyramidal Form, ſome Cubical. The Colours were different, ſome Whitiſh, ſome Brown, ſome Blewiſh, ſome Black, or of a Dark Colour; the Conſiſtence of a Sandy Stone: They are not made up of ſeveral Coats upon other (as many confirmed *Stones* are) but look like Bricks, and may eaſily be mouldred to Powder; ſome in Thickneſs the 12th, ſome the 10th, ſome more than the 6th part of an Inch, and ſome half an Inch

Inch long; moſt of them approach'd to a Triangular Form. He found a Weight in the *Bladder* when they fell down; and he told me, he was ſenſible they came down the *Ureters*. He leap'd and ran ſometimes to haſten their Deſcent. In a Fortnight's time, he hath paſs'd above 60 of them by the Yard. Upon the 20 and 21 of *June*, he paſs'd 3 by the *Fundament*, ſince which he paſs'd none by the Yard. Two of them were Triangular, pretty big, and one as big as a little Plumb, but of the Shape of a Pear; of the ſame ſandy Conſiſtence as the former, and of a Greyiſh Colour. His Parents told me, that for ſome Years, that they liv'd near to the Shore of the *Firth* of *Forth*, the Boy ran often after the Women that catch'd the Sand Eels (*Ammodites*) and brought home his Pockets full of them, which oftentimes he boil'd without taking Pains (as he ought) to free them of the Sand that ſtuck to them. This, with the Glutinous Juice of that Fiſh, and the Sand mix'd with the Bread, and other Aliments he us'd, hath furniſh'd abundant Matter for theſe *Stones*. It is like (ſince he never had any Symptom of this before the Fall he got of late) the Hurt in the hinder part of the Head might have occaſioned ſome *Torpor* in the Nerves, ſo that the *Fibrillæ* in the *Kidneys* could not act ſo vigorouſly (as need was) in the Separation and Expulſion of the *Sand*; and thus it came to gather and form into *Stones*.

2. I had the Diſcovery of the *Cheat* of theſe *Stones* from Dr. *Pitcairn*, who was at the Pains to find it out. This roguiſh Boy to be kept from School, had ſo much Cunning as to impoſe upon a fond Mother and other People.

The Cheat detected; by Dr. Jo. Wallis. n. 266. p. 688.

LXXII. A Divine about 70 Years of Age, after he had theſe 10 Years ſuffer'd much from a confirm'd *Stone* he hath in his *Bladder*, in 1697, paſt: a vaſt number of *Slices* of ſeveral Figures, many of them Cornered and Pointed; much of the thickneſs of a Shilling *Sterling*; White within and Smooth, but without of a Dark Colour; with Pain, and ſometimes a *Suppreſſion* of *Urine* for ſeveral Hours precedeth them; he maketh Uſe of the uſual Remedies: in the Intervals he hath tolerable good Health.

Broken Stones Voided; by Sir Rob. Sibbald. n. 242. p. 267.

I am alſo told by an expert Phyſician of 2 Patients of his, the one yet alive, who after paſſing an incredible number of theſe *Slices*, is now in perfect Health, and free of that Diſeaſe. The other, who dy'd long ago, after paſſing for a long time ſuch *Slices*, became free of the Diſeaſe, and when his Body was open'd at his Death, no *Stone* nor *Slices* were found in his *Bladder*.

LXXIII. 1. The Patient, from whom this *Stone* was cut, told me, That about 8 Years before it was taken from him, he ſuffer'd an exceeding Cold in a Winter Sea-Voyage, which laſted much longer than he expected; and that, not long after his Landing, he found a certain *Nodus* or hard Lump in the very place whence this *Stone* was Cut. From that time, upon all freſh Cold-taking he ſuffer'd much Pain, in that Part eſpecially; and yet, that Cold being once over, that Part was no more Painful than the reſt of his

A Stone Cut out from under the Tongue; by Dr. M. Liſter. n. 83. p. 406.

Mouth. In the 7th and 8th Years, it often caus'd ſudden Swellings in all the *Glanduls* about the Mouth and Throat, upon the firſt Draught of Beer at Meals, which yet would in a ſhort time fall again. But at laſt it began its work with a ſudden *Vertigo*; which Vertiginous Diſpoſition continu'd more or leſs from Spring till *Auguſt*; in which Month, without any previous Cauſe ſave Riding, the place where it was lodg'd ſuddenly Swell'd, and ran Purulent Matter at the Aperture of the *Ductus Whartonianus*. But it ſuddenly ſtopt of its running (which he cannot attribute to any thing but Cold,) and ſwell'd with a great Inflammation, and very great danger of Choaking, it being ſcarce credible, what Pain he ſuffer'd in endeavouring to ſwallow even Beer, or any Liquid thing. This Extremity laſted 5 Days, in all which time the Party had ſo vaſt a Flux of Spittle running from him, that it was not poſſible for him to repoſe his Head to Sleep, without wetting all the Bed about him; inſomuch as that it was very much queſtion'd by ſome Friendly Viſitants, whether he had not of himſelf, or by miſtake, made uſe of ſome Mercurial Medicine. The firſt Day the *Saliva* ran thin and tranſparent, almoſt like Water without any Bubbles; The ſecond Day, it ran Frothy, it Taſted Salt, (which yet he is apt to think Hot rather than really Salt, becauſe that Day the Inflammation was at the Height;) The third Day, it roap'd exceedingly. On this Day, a ſmall Pin-hole broke directly over the place of the *Stone*, and ran with Purulent Matter as formerly; The fourth Day, the *Saliva* ran Inſipid, ſenſibly Cold in the Mouth, (which again confirms me in that Opinion, that the former ſharp Taſt was the Effect of Heat and not the immediate Quality of a Salt Humour) very little Frothy; The fifth Day, (which was the Day of the Inciſion,) it ran as on the 4th, but left an extream Clammineſs on the Teeth, inſomuch that they often clave together as though they had been joyn'd together with Glue.

Upon the Inciſion, which prov'd not wide enough, the Membranes or Bags, wherein the *Stone* lay, came away firſt. The *Stone* it ſelf was ſo hard as to endure the *Forcipes* in drawing it forth. It was cover'd over with Graſs-Green Matter, which ſoon dry'd, and left the *Stone* of a Whitiſh Colour. It is but light in proportion to its bulk, weighing about 7 Grains; and 'tis much of the ſhape of our ordinary Horſe-beans. There are viſible Impreſſions upon it of ſome Capillary and Small Veſſels, it was bred amongſt. Laſtly, It is Scabrous or rough, Sand-like, altho' the Subſtance is *Tophaceous*.

A Stone bred at the Root of the Tongue; by M. Bonavert. n. 247. p. 440.

2. *Tho. Wood* of *Wrotham*, was ſo troubled with a *Quinſy*, that he could hardly Swallow any Liquid. I found the *Tumor* tend to Suppuration Inwardly, about the Root of his Tongue on the Right ſide; but without any Sign of Suppuration Outwardly, though it appear'd there almoſt as big as an Egg. I ordered him Maturating Gargles; and the next Day he broke it with his Finger, and brought out of his Mouth near $\frac{1}{4}$ of a Pint of Matter, and with it at laſt a *Stone*. He had likewiſe a *Ranula*, and before he had broke the *Tumour*, and ſpit out the Corruption, he could hardly Speak. I believe this *Stone* to be of the ſame Nature as thoſe generated in the *Kidneys* and *Bladder*.

3. The

3. The Weight of this *Stone* in Air is 7 *Gr.* in Water $3\frac{1}{8}$; and therefore its *Specifick* Weight compared with Water, is as 1931 to 1000. *By ..... Ib.*

LXXIV. Mr. *Robert Bacon* of *Windsor*, above 75 Years Old, Sanguine and Chearfull in his Natural Temper, about 12 Years before his Death was observ'd by his Friends, at his return home from Walking, to bend double to his Right-side, insomuch that he would be ready to fall, and has been brought home in Coaches and Sedans, yet was always Temperate, and never observ'd to be Disorder'd with Drink in his Life. He would often say, That he fear'd Fatuity or Distraction, and would Pray that God would keep him in his right Mind. In his latter Years, his Appetite to all sorts of Food inclin'd to *Canine*, and his Thirst very great; He often complain'd of Pain in his Bowels; He was always desirous to have his Head rubb'd many times in the Day; His Urine and Excrement came away always involuntary, at Bed, Board, *&c.* of which he did not seem at all to be sensible. Of late he would always Hang down his Head in a Prone Sleeping Posture, and his Head was very Hot; he did Sweat very much every Night, and wet his Linnen extraordinarily. And in the whole, his Rational Faculties seem'd to be quite lost, for a great while before he dy'd; for he would usually take up Tongs, Fire-Shovel, Brooms (many times all together) to walk by, though he had a Staff of his own; he would also hale the Chairs about the House and up the Stairs, and grasp at any thing with his Hands; he would often Tumble on the Ground, and seldom Rise without help; he did rather Creep along by Walls and Chairs than go, tho' formerly he went very upright; of late it was 2 or 3 Folks work to support him to his Bed; he would put 2 or 3 Hats at a time upon his Head, like an Antick; he would many times strike those that attended him. He Dy'd of a Fever *Nov.* 4. 1686. *A Stone in the Glandula Pinealis; by Sir Edm. King. n. 185. p. 228.*

Upon Dissection, we found the *Liver* indifferently well Colour'd and Firm; The *Spleen* shrivell'd; The *Omentum* whole but ill Colour'd; The Right *Kidney* Sound, with a few small *Stones*; The Left *Kidney* two parts of three wasted, and some course *Gravel*, but both *Kidneys* very Fat; The *Bladder* of *Gall* fill'd with one *Stone* only, and that no bigger than a long Nutmeg; some little course *Gravel* and small *Stones* in the *Bladder* of *Urine*; The *Lungs* well enough, only by the Stagnation of Blood discolour'd, and fill'd in several places with *Ichorous* Spumy Matter; The *Pericardium* very Thin and too Tender, and too little Water in it; Very little Blood in the *Ventricles* of the *Heart*; The *Auricles* of his *Heart* perfectly sound and strong, as of any Sound Man of 20 Years Old; Those and the Strength of the Muscles of the *Heart* I admir'd.

The *Dura Mater* was extremely Hard, Thin, and White, a slender Imbroydery of Vessels; The *Pia Mater* all full of seeming Turgid *Glands*, and a great Distention of *Lymphæducts* full of Coagulated *Lympha*; The Substance of the *Brain* Loose and Shrunk, very White, very little of the *Cineritious* Colour to be seen; The *Corpus Callosum* very Flaccid; The whole Body of the *Brain* was Shrunk about a 3d part: Between the 2 *Meninges* of the *Brain*, was near a Pint of extravasated *Serum*, that must needs oppress

the

the *Brain* very much; The *Ventricles* of the *Brain* full of *Serum*; The *Plexus Chorcides* extreamly large, in Length as well as Breadth and Thickneſs; The *Nates* and *Teſtes* very Small and Shrunk; The *Thalami Nervorum Opticorum* Plump and Fair; The *Corpora Striatæ* Large and Fair, full of large *Striæ* as I have ſeen.

The *Glandula Pinealis* was Firm and Fair, well Colour'd to look on, of the exact Figure and ordinary Size: Feeling of it, and finding it harder than ordinary, I preſt it, and found in it a *Stone* in a Film, or rather a *Petrified Gland* in a Film. I do not remember I ever Heard of ſuch a thing before; I am ſure of all the *Brains* I have Diſſected, (and I may ſay I have Diſſected, more than an Hundred) I never Saw ſuch a one. The *Glandula Pituitaria* was half Waſted; that part that was left was very Hard and Brittle, had not the Tone of a true *Gland*, nor Subſtance, according to my Obſervations, unleſs of a Vitiated *Gland*; The *Cerebellum* ſeem'd well enough, and all down the *Cauda Medullæ Oblongatæ*.

Before he became ſo Mopiſh, he would ſay, he felt a certain kind of Fierceneſs within him, which (it is probable) made him to utter ſome kind of Vociferation when he was diſpleas'd at any thing.

Stones *found in the* Heart; *by*... ..... *n.* 5. *p.* 86.

LXXV. The *Belly* of the *Earl* of *Balcarres* being open'd, the *Omentum* was found Lean and Small; His *Liver* very big; The *Spleen* big alſo, fill'd with a black and thick Humour; His *Stomach* and Entrails all empty, of a Saffron Colour, diſtended with Wind only; The *Bladder* of *Gall* Swell'd with a black Humour; The *Kidneys* fill'd with a kind of Grumous Blood. In the *Thorax*, the *Lobes* of the *Lungs* were all entire, but of a bad Colour; On the Left-ſide ſomewhat Black and Blue, and on the Right Whitiſh; with a Yellowiſh Knob under one of the *Lobes*.

The *Pericardium* being open'd, there appeared none of that Water in which the *Heart* uſes to ſwim: And the External Surface of it, from the Baſe to the Tip, was not Smooth, but very Rough. It being cut aſunder, a quantity of Thick and Inſpiſſate Liquor run out: And beneath the Baſe, between the Left and Right *Ventricle*, two *Stones* were found, whereof the one was as big as an Almond; the other, two Inches long and one broad, having 3 Auricles or criſped Angles: And in the Orifice of the Right *Ventricle*, there was a Fleſhy Fattiſh Matter.

The whole Body was Bloodleſs, Thin, and Emaciated; of a black and blewiſh Colour. The *Skull* being open'd, both the *Cerebrum* and *Cerebellum* were big in proportion to the Body; and out of it run much more Blood than was ſeen in both the other Regions together.

Stones *found in the* Lungs; *by* Mr. Ch. Kirkby. *n.* 71. *p.* 2159.

LXXVI. A Boy near *Dantzick* about 19 Years Old, who had been from his Cradle diſpoſed to a *Conſumption*, accompanied with a continual Coughing, great Emaciation, and continual Heat, and labouring under this Diſtemper Dy'd. Being opened, a great quantity of watry Matter run out of the *Abdomen*, of a Chylous conſiſtence; almoſt all the Glandules of the *Meſentery*, through which paſs the *Venæ Lacteæ*, were extraordinary great

and

and hardned beyond the hardneſs of a *Schirrhus*. The *Lungs* were grown to the Breaſt round about, almoſt inſeparable, full of Purulent Ulcers, but more eſpecially the Left Side, obſtructed and fill'd with much *Gravel* and ſmall *Stones*; yea, whole pieces of the *Lungs*, eſpecially the Extremities, about the thickneſs of a Finger and more, were Hardned into a *Stony* Matter.

LXXVII. After throwing up the *Sternon* of a Woman, I found the *Lobes* of the *Lungs* extremely Turgid, and its Veſicles impleat with a Grumous Blood; Their inveſting Membrane in the upper part adhered firmly to the *Pleura*; the Right *Ventricle* of the *Heart* was fill'd with a large quantity of Coagulated Blood, but the Left ſeem'd Exſanguious; and I obſerv'd a Stagnation, and great Extravaſation of Blood upon the Right Side of the *Pleura*. Beneath the *Diaphragm* I found the *Ventricle* and *Inteſtines* much inflam'd; The *Omentum* fair and large; The *Spleen*, to Admiration, ſo augmented in Bulk, that I ſuppoſe it weighed not leſs than 2 or 3 Phyſical Pounds: Upon cutting through its Body, there was diſcharg'd ſeveral Ounces of a very Fætid and Putrified Blood. The *Liver* alſo was much larger than uſual, but its *Parenchyma* firm and ſound.

Stones *found in the* Gall Bladder; *by Mr.* J. T. *n.* 209. *p.* 111.

The *Veſica Bilaria* ſeem'd full of *Bile*: but more curiouſly Examining of it, I found a *Stone* very beautifully cruſted over with *Chryſtalized Salts* of various Figures, Conical, Cubical, Pyramidal, *&c.* The one half of it lay immerſt in *Bile*, whoſe Quantity was inconſiderable: for indeed this *Lapidious* Concretion took up the whole Cavity of the *Bladder*, and weighed, immediately after it was taken from its Receptacle, 2 *Dr.* 15 *Gr.*

We diſcovered in one of the *Kidneys* a large *Abſceſs*, and diſcharged a great quantity of Wheyiſh Matter.

LXXVIII. *An.* 1690. A Lady, who had been drinking the Waters at *Moffet-Wells*, in *Annandale* in *Scotland*, by Advice of her Phyſicians, for a continual Vomiting, and the *Dolor Nephriticus*, dy'd there in a Fit of Vomiting. Upon Diſſecting the *Stomach*, I found a *Stone* of the bigneſs and form as in the *Figure*. The Corner *a*, was almoſt fix'd in the *Pylorus*, ſo that the Paſſage from the *Stomach* to the *Inteſtines*, was near quite ſhut up. The Subſtance of this *Stone* is a little Spungy, weighing about 8½ *Dr.* In the Left *Kidney*, I found alſo a *Stone* of the ſame Subſtance, weighing about 5 *Dr.* and in the *Gall-Bladder* I found ſeveral *Stones*, weighing 2 *Drams*.

Stones *found in the* Stomach, Kidney, *and* Gall-Bladder; *by Mr.* Will. Clerk, *n.* 250. *p.* 95.

Fig. 41.

I am apt to believe, that ſome Extraneous Body gave Origine to that in the *Stomach*, as it frequently happens even in thoſe extracted from the *Veſica Urinaria*: Thus an Iron Tag, a Leaden Bullet, *&c.* have been found the Kernels of ſeveral *Stones*. And that ſeveral Extraneous Bodies are oftimes found in the *Stomach*, being ſwallow'd over, either willfully, or by accident, we have the Authority of *Sennertus* and others. And one Mr. *Cameron*, who ſome Years ago in a Frolick ſwallow'd Half a Crown, is alive to this Day, and finds no great Inconvenience thereby.

Lib. Prax. 3. *par.* 2. *Sect.* 1. *Cap.* XV.

Theſe *Stones*, Generated in the *Stomach*, excite horrid Pains, but there are ſcarce any clear Signs by which they can be diſtinguiſhed from others, except

except the continuance of the Pain; ſometimes they are ejected by Vomit; and ſometimes they adhere to the bottom of the *Stomach*, of which we have a notable Inſtance in *Horſtius*.

Lib. Inſtit. p. 142.

But Stones are alſo formed in all other Parts of the Body, of which we are aſſured by manifold Obſervations and Experience; as in the *Brain*, *Kidneys*, *Ureters*, *Gall-bladder*, *Tongue*, *&c.* and ſome are voided *per Anum*. But more ordinarily *Stones* are form'd in the *Kidneys* and *Bladder*: Becauſe theſe Veſſels are more properly deſigned to ſeparate, and contain, the *Serum* of the Blood; and for that Reaſon *Stones* in the *Reins*, and *Veſica Urinaria*, are more troubleſome to Perſons afflicted therewith, than in any other Part of the Body, 1. Becauſe the Parts are more ſenſible; 2. Becauſe they ſtop the Paſſage for evacuating the *Serum*, that is continually ſeparating from the Blood, and by conſequence Diſtend the Veſſels and ſo cauſe Horrid Pains.

Vid. ſup.

Stones *voided by* Seige; *by Dr.* Sam. Threaplaid. *n.* 170. *p.* 961.

LXXIX. A Carpenter, near *Hallifax*, about 40 Years Old, of a ſtrong habit of Body, and very Laborious in his Calling, made a great Complaint to me of the ſad Torture he had ſuffered by reaſon of two *Stones* he had voided by *Stool*, about *Chriſtmas* 1684. He perceived no diſorder in his Body, till within 5 or 6 Days that the Firſt came away; then he began to complain very much of a Pain in the Belly, much reſembling the *Colick*; and of a Stoppage in the *Inteſtines*, not much unlike that in a *Teneſmus*, having frequent provocations to go to Stool, but to no purpoſe upon tryal. He took little or no Reſt in all that time; his *Stomach* retained ſcarce any Meat or Drink it received; till in the Concluſion one of the *Stones* came into the *Inteſtinum Rectum*; where it lodg'd for a day's time; then coming within the reach of his Finger, he drew it out by Force, and then he was preſently very well. A fortnight after that, the other begun to move; which occaſioned a Pain beyond the former in proportion to its Bulk; and kept him upon the Rack about 8 Days; during which time there was an abſolute *Suppreſſion* of *Excrements*; and when the *Stone* came into the *Rectum*, it continued near two Days within the reach of his Finger, with which he could not Draw it out by any means; till at length he bent a ſmall piece of Iron into the form of a Hook, with which rude Inſtrument his Servant drew it forth with much ado, and not without Wounding the Rugous Coat of that Part. After this was gone he ſoon recovered his former Condition.

About 7 Years before, the very like Caſe had befaln him, Voiding 2 *Stones* after the ſame manner, and about equal bigneſs.

A Bullet *voided by* Urine; *by Dr.* Nath. Fairfax. *n.* 40. *p.* 803.

LXXX. *G. Eliot* of *Mendleſham* in *Suffolk*, a Pale, Middle-ag'd, Full-bodied Woman, ſorely afflicted for ſome Years with a Torment of the Bowels, was prevailed with by a Neighbour, who had ſuffered much in the like Caſe, to ſwallow two fit *Bullets*: whereupon ſhe found (as he had done before her) preſent eaſe. But afterwards her Pains returned and increaſed, and ſhe having many Conflicts for about 15 Years, then applyed her ſelf to my Apothecary, Mr. *Gibſon* of *Stow-market*, who adminiſtred to her in the Fit a

Doſe

a Doſe of Lady *Holland*'s Powder, which ſhe took in Poſſet-Drink in the Morning, was moved gently by it in the Afternoon, ſpent that Night in Torture of Body with Vomitings, and next Morning, during the uſe of the Chamber-pot, together with the *Urine* there came ſomething from her, which gave a twang againſt the ſides of the Veſſel. The *Urine* being pour'd off warily, there was left in it a Heavy and (to appearance) Gravelly *Stone*, of a Colour between Yellow and Red, near as big as one's Thumb's end (as ſhe confidently aſſerts to me,) but making Uſe of an Hammer, and knocking off the outer parts of its Cruſt, they came at a *Bullet* enclos'd in it, of a kind of Brazen Colour on the outſide; but cutting a little with a Knife, it proved *Lead* within: which being diſcover'd could eaſily be accounted for. Asking her, If no Inquiry had been made of ſuch a *Bullet*'s coming from her before? She told me, That ſome Days after ſhe took them, the Stools had been ſlightly examin'd, but finding neither, they gave over ſearch. She being further asked about the Bigneſs of the *Bullet*? She told me, it was apparently Bigger when ſhe took it, than when ſhe voided it. The State of her Body in reference to the *Stone*, being inquired into; ſhe ſaid, That ſhe had, before and ſince that befell her, been a Voider of abundance of Red *Gravel*, and particularly about 3 Years after ſhe took them ſhe Voided a conſiderble Reddiſh *Stone*. When I asked her, about the manner of affecting her Body at the coming forth; She anſwer'd, 'Twas much like a common Fit of the *Stone*, only it held her longer (laſting ſome Weeks) bow'd her ſadly forward, (as a *Stone* often does in the *Ureters*) provok'd to Vomitings, and particularly ſhe felt it crowd lower and lower from the *Kidney* to the *Bladder* in the Left *Ureter*. Asking her farther, Whether ſhe was ſure, it came by the Paſſage of *Urine*, and not by *Siege*? She aſſur'd me, ſhe was not miſtaken in that. And indeed, the *Gravelly* Coat, which the *Bullet* hath, ſhews ſufficiently whereabout 'twas lodg'd. Inquiring alſo, Whether the other *Bullet* was come from her? She ſaid, no; for ought ſhe knew 'twas ſtill in her Body. And as to her State ſince this Evacuation, ſhe ſaith, That ſhe hath had ever ſince *Stone-Cholick* Pains, but none in ſo high a degree as before.

The main Uſe I would make of this Inſtance, is to ſtrengthen a Conjecture I have had a long time, of ſome other Paſſage from the *Stomach* to the *Bladder*, beſides what Anatomiſts have hitherto given Accounts of: For that this *Bullet* never came at the *Ureters* through the Veins, Arteries, Nerves, *Lymphe-Ducts* (the only Veſſels that can be charg'd with it) is, I think, beyond Diſpute. If it ſhall be ſaid, That Nature, when put to Shifts, finds out ſtrange Conveyances to rid the Body of what is Extraneous and Offenſive to it, becauſe many Inſtances are known making that good; yet I think it not ſo pertinently urg'd, foraſmuch as ſome other Inſtances ſeem to ſide with it, which cannot be taken off by the ſame Evaſion; *viz.* Many do find, that Drinking 4 or 5 Glaſſes of *Rheniſh* (for Inſtance) within leſs than a quarter of an Hour they ſhall have a ſtrong liſt to make Water, eſpecially if the Body hath been agitated. Now that it ſhould paſs through the

Lacteals, Veins, Heart, and Arteries, and be ſtrain'd from the Blood in ſo ſhort a time, is to me ſcarce conceivable.

But ſurely this Shorter Paſſage (wherever 'tis) is as Natural as that by which it ſhould have gone, had it ſtay'd longer in the Body: Not to ſay, how little it ſavours of the Rankneſs of the *Kidneys*, and how much it reſembles that which it was before 'twas taken into the Body. And methinks, the Conveyance of the *Milk* into the *Breaſt*, hath much Affinity with this of the *Urine* into the *Bladder*; the ſudden preſſing whereof into the Papps after the Nurſes drinking ordinary Milk, could no more be explain'd by the ordinary Doctrine of *Circulation*, than this of the *Urine* into the *Bladder*, till the Shorter Cut was hit upon by the *Ductus Thoracici*; though ordinarily it may be ſtrain'd from the Arteries, as the *Serum* alſo in the *Kidneys*; only in a Milk-flood Nature finds ſome other Channel there, as here in a Water-flood.

A Shell found in the Kidney; by Dr. Robert Pierce. n. 171. p. 1018.

LXXXI A Gentlewoman (at *Bath*) about 28 Years of Age, very Fat, and Corpulent, after having been long troubled with frequent, and ſometimes violent Vomitings, fell at length into a *Fever*, and Dy'd in few Days, and on a ſudden. I open'd the Body and quickly found what might account for her long Vomiting (and perhaps her *Fever* and Death too) *Scil.* an Ulcer in the *Pancreas*; which had Sphacelated ſome part of the *Stomach* and Bowels, that lay neareſt to it. Her *Kidneys* were cover'd with a prodigious quantity of Fat; which removing with my Hand, and reaching one of the *Kidneys*, I felt ſomething prick my Finger in the lower part of the *Kidney* where the *Ureter* is inſerted: I preſently concluded it to be a *Stone*, and took it out, with an abundance of Mucous Bloody Matter about it. I found not ſo much as *Gravel* (much leſs any *Stone*,) in either of the *Kidneys*. When I had waſhed off the Mucus that was about the ſuppoſed *Stone*, I found it to be a ſmall *Shell*, very finely Wrought; in the Hollow of it, there was a Mucous Slimy Matter, not at all unlike the Subſtance of a *Snail*, as to Conſiſtence, but of a Bloody Colour.

Fig. 42. *Fig.* 42. Repreſents this *Shell*, ſomewhat Magnified. Thoſe Indented Checkers, are every other a little Depreſſed and Elated: and very exactly Wrought. There are 6 or 7 Spiral Lines, or Rounds, in the *Turban*.

A Stone grown to an Iron Bodkin in the Bladder; by Dr. M. Liſter. n. 168. p. 882.

LXXXII. This *Stone* was Cut out of the *Bladder* of a Boy at *Paris*; by M. *Colo*. The *Iron-Bodkin*, to which the *Stone* grew, and which paſſes through the middle of it, had been thruſt up into the *Bladder*, by the Boy himſelf, about 2 Years before the Inciſion.

Fig. 43.

A Bodkin Cut out of the Bladder of a Woman; by Mr. Proby. n. 260. p. 455.

LXXXIII. *Dorcas Blake*, (in *Dublin*) a Full-bodied Sanguine Maid, about 20 Years Old, was much troubled with a Hoarſneſs laſt Winter, for which ſhe was very deſirous to take a Vomit; but her Friends not conſenting to it, ſhe endeavour'd to provoke one, *Jan.* 5. 1694. by thruſting her Finger into her Throat; which not anſwering her deſires, ſhe drew an *Ivory Bodkin*, of 4 Inches long, out of her Hair, and thruſt the ſmall End forward

Fig. 22.

Fig. 23.

Fig. 24.

Fig. 25.

Fig. 26.

Fig. 27.

Fig. 28.

Fig. 29.

Fig. 30.

Fig. 31.

Fig. 32.

Fig. 33.

Fig. 34.

Fig. 35.

Fig. 36.

Fig. 37.

Fig. 38.

Fig. 39.

Fig. 40.

Fig. 41.

Fig. 42.

Fig. 43.

Plate 3. Vol. 3. Pag. 162.

ward into her Throat, upon which she heav'd so often as put her out of Breath, and oblig'd her to stand upright to draw some Air, which she did without taking the *Bodkin* out of her Throat, and at that instant it slipt out of her Fingers, and pass'd into her *Stomach*. She found no immediate Inconvenience; but the next Day about Noon, she felt a sharp pricking Pain in the Right Side of her Belly, lower than the Navel: and towards Evening she felt the Pain nearer her Right Groin than before, which oblig'd her to go to Bed, where she lay Restless all that Night, by reason of the excessive Pain. *Jan.* 7. A Midwife searcht her, and said, she felt the End of the *Bodkin*, but thought it was in a Gut. *Jan.* 8. at Night she sent for me. In searching her by the *Anus*, I could not find it; but putting my Finger into the *Vagina Uteri*, I felt the *Bodkin*: And because she complain'd of a difficulty in Voiding her *Urine*, I made use of my *Catheter*, and felt it as I conceive in the *Bladder*; but immediately trying a 2d time, I could not find it. Within a Fortnight after, it was very plainly to be felt: and about 10 Days after this (her Body being duly prepared for the Operation) I attempted to Extract it, after the same manner as I do *Stones* from *Women*. But having introduced my *Forceps* into the Neck of the *Bladder*, and very readily taken hold of the *Bodkin*, I could not move it. I then pass'd in my Finger thro' the Dilatation into the *Bladder*, and try'd to bring the whole *Bodkin* into the *Bladder*, but could not; nor could I turn it one way or another, but round like a Spindle, the smaller End (as I imagine) resting upon the *Ischium*. Finding all my Attempts to be fruitless, I despair'd ever to effect it this way, which made me desist from farther Tryal. But after some time her Pains increasing, she prevail'd on me by her daily Importunity to attempt the Extracting of it in the manner of the *Higher Operation* for the *Stone*, which was as follows; Dr. *Madden*, Dr. *Molineux*, and Dr. *Smith*, being present. Having placed her in a convenient Posture, I put my Finger into the *Vagina Uteri*, and felt the *Bodkin* lying close to it on the outside; whilst I held my Finger there, I press'd with my Left Hand above the *Os Pubis*, where I felt the Head, or Thickest End, of the *Bodkin*. I then remov'd my Right Hand, and desir'd Dr. *Smith* to put his Finger into the *Vagina*, as I had done before, and press hard against the *Bodkin*; which he did, and held it very firm and steady, whilst I made an Incision about an Inch and half in length, on the outside of the Right *Musculus Rectus*, till I came to the *Bladder*. I then pass'd my Fore Finger and Thumb into the Wound, and got hold of the Head of the *Bodkin*, (the Substance of the *Bladder* only being between) upon which, with a small crooked *Bistore*, I Cut the *Bladder*, and by gently pressing my Finger and Thumb the *Bodkin* slipt out of the *Bladder* between them, by which I very easily Extracted it. I Dress'd the Wound and put her into Bed, and in less than a Month, by God's great Blessing, she was perfectly cured.

Jun. 10. 1695. The Young Woman went before the *Lord Mayor*, and made Oath, That the above Relation is true in Substance, and that she did Swallow the *Bodkin* therein mention'd.

The *Bodkin* was Cut out of her *Bladder* that day 9 Weeks that she swal-

lowed it. There was but half of the *Bodkin* in the *Bladder*, which was incruſtated with a Gravelly *Calculous* Matter; the other half was out of the *Bladder* in the *Pelvis*, the Point reſting upon the *Iſchium*.

A Stone from the Bladder, with a Flint in it; by Dr. Geo. Garden. n. 266. p. 689.

LXXXIV. A Boy of 5 or 6 Years of Age, near *Aberdeen*, was Cut for a *Stone*; which being by Accident broke a little, there was ſeen within it a *Flint-ſtone* ſhap'd like to that of a Piſtol, with the *Calculus* Cruſted about it. I ſaw this *Gravel-ſtone* with my Eyes, having the *Flint* in one ſide of it, but Cruſted above. That the *Flint* has not been formed in the *Bladder*, but that this might have been occaſion'd by the Boy's ſwallowing of the *Flint-ſtone*, ſeems probable from another ſtrange Inſtance of a Man, in the ſame Country, his Voiding with his *Urine* a ſmall *Piſtol-Bullet* Cruſted over with *Calculous* Matter, after the ſame manner.

A Piſtol-Bullet Cruſted over, Voided by Urine.

A Stone from the Bladder, with Hair growing on it; by Dr. Jo. Wallace. n. 266. p. 688.

LXXXV. I had an Account of Sir *Will. Elliot's* Piſſing *Hair*, from Sir *Archibald Stevenſon* and Dr. *Pitcairn*, his Phyſitians; and after his Death I ſaw the *Stone* that was taken out of his *Bladder*, which was about the bigneſs of a Gooſe-Egg; the *Stone* was Hard and Heavy, and for the moſt part covered over with a Scurf, not unlike the Lime-morter of Walls, and in the Chinks of the Scurf there were ſome *Hairs* grown out. 'Twas thought the other *Hairs* he Piſs'd in his Life time, which were a great many, and ſome of an extraordinary Length, did grow out of that *Stone*; becauſe when the *Hairs* would hang out of his *Penis*, as they did frequently to his great Torment, they were oblig'd to pull them out, which was always with that Reſiſtance as if pluck'd out by the Root.

A Stone in the Bladder of a Dog; by S..... n. 84. p. 4094.

LXXXVI. A pretty *Spaniell* (in *Italy*) 2 Palms and a half high, and an Excellent Setter for Quails, being kept ty'd, as ſuch *Dogs* are wont to be, would rather have burſt than Urine or Dung in the place where he was kept. By reaſon of his aptneſs to Bite, he was Cut when he was 5 Years Old; and 2 Years after that, he began to *Urine* with much Difficulty. Whereupon, as often as he was let looſe, he ran preſently into the Garden and fell to eat of *Pellitory of the Wall*, and *Fig-Leaves*; which *Matthiolus* and others obſerve, to provoke *Urine*, and cleanſe the *Reins*. This Diſeaſe continu'd upon him for 5 Years together, ſometimes with that Violence, that his Maſter had him Syring'd, and anointed with *Oyl* of *Scorpions*, and uſed other Remedies to help the poor Creature. At length he Dy'd at 12 Years of Age; and being open'd, there was found in his *Bladder* a *Stone* weighing an Ounce, of an Irregular Figure, White, yet here and there with ſome Reddiſh Specks; and in the Bottom of the *Bladder* was found ſtore of ſmall White *Gravel*; and in the Mouth of the *Urinal-Paſſage*, a *Stone* as big as a great *Pine-Kernel*, White and Tender. The reſt of the Body was all Swell'd.

A Stone faſten'd to the Back-bone of an Horſe; by S..... ib. & Ph. Col. n. 7. p. 195.

LXXXVII. There was lately a *Stone* of a very extraordinary bigneſs found in the Body of a *Spaniſh* Gelding, about 13 or 14 Years Old, which Dy'd in the *Academy* of M. *de Bernardy*; the Weight of it being 4 Pound, of a Roundiſh

Roundiſh Figure, a little Flatted; its longeſt Diameter was 5 Inches, and its ſhorteſt 4: It was of the Colour of an Olive, but a little inclining to a Brown, mark'd with ſeveral Red Spots reſembling Coagulated Blood; Radiated circularly with Black and White Veins and Waves; But for the reſt of it ſo delicately Poliſh'd, that it Reflected the Images of the Objects about it. It was found invellop'd in a Membrane of Fat, and faſten'd by two Ends to the *Spine* of the *Back*, near the *Kidneys*: It was more than 12 Hours after the *Horſe* was Dead before it was taken out of its Body, when it was found very Hot, though the Body of the *Horſe* was quite Cold; and it retain'd a conſiderable Heat about 6 Hours after it was taken out.

A Stone taken out of the Belly of a Horſe; *by Dr.* H. P. *Ph. Col. n.* 7. *p.* 191.

LXXXVIII. Immenſæ Molis *Calculus* haud ita pridem in Villa *Lambethana*, ex *Equi* Viſceribus exemptus, pondere erat, 4 Lib. & totidem Unciarum, magnitudine quaſi Capitis Humani, & Figura non multum abſimili, Oblonga quidem, non tamen tam Rotunda quam Sima. Ille qui *Calculum* exemerat, Partium opinor earumque Situs ignarus, aſſerit illum inventum eſſe inter *Veſicam* & *Inteſtinum*: Et tamen fortaſſe non totus à Scopo & rei Veritate aberravit. *Calculus* quippe ex una parte Planus erat & Lævigatus, utpote per quam *Urina* continuo curſu non ſine Lucta & Nixu, propter anguſtum illi relictum locum, colata pertranſierat; ex altera parte, quæ *Veſicæ* incumberet & adhæreret, Aſper & Rugoſus, Lapidem Bibulum referens, qui cum mole & pondere quotidie creſceret, inſtar Lapidis Molaris totam tandem corruperat teneram *Veſicæ* Tunicam, ut ejus nullum prorſus maneret Veſtigium. Et forte ſi quis attentè adverteret, ipſum Fimum propter pondus *Inteſtino Recto* incumbens in aliam, quam quâ ſolet, Figuram compreſſam etiam cum difficultate excerni notaret. De *Equo*, Dominus ſub quo per 12 Annos fido Obſequio & Labore meruerat, hæc retulit; Erat Staturâ 15 Palmarum, deſtinatus Pannis vehendis & revehendis, nunc Sinceris, nunc Coloribus infectis. In iis, quorum nulla certa conſtat ratio, omnia ſuſpecta habentur. In Pannis Tingendis plurima petuntur ex Mineralium Familiâ, *Calcanthum*, *Alumen*, variique *Sales*, & alia etiam cognatæ ſortis ex Animalium & Vegetabilium Claſſe, quorum etiam hic frequens uſus eſt. Panni his rebus infecti, & calentes ex puteis extracti in *Equum* coacervantur, qui ſub hoc onere gemit & fatiſcit. Hic fortaſſe non ineptè quæri poteſt, annon ex his tam arctè preſſis & cohærentibus ſubtiliora exeant Effluvia, quæ furtivâ Inſpiratione attracta, aliquid ſaltem faciant ad *Calculi* Concretionem, & particulas *Salinas* Glutine quodam congregent & uniant? Non parum Momenti habet in fide huic conjecturæ faciendâ, quod Liquor iſte, quo *Tinctores* ſæpius utuntur, Spiritu *Vitriolico* Fœtus concretionem maxime promovet. Quod videre eſt in pluribus *Angliæ* locis, ubi Spiritus iſte obtinet, qui quicquid illi obvium fit arripit, Ligna, Teſtas, Paleas, Cruſta Lapidea involvit. Magna ſæpe fiunt ex minimis, diuturnâ præſertim conſuetudine repetitis. Niſi hodiè exoleſceret prorſus Opinio, quæ diu apud Antiquos immota ſtetit, *Renum* ſcilicet Calorem eaſdem in *Calculo* faciendo partes habere, quas Ignis habet in Lateribus Coquendis, hic imprimis valeret, cum *Equus* ſub Monte quidem Pannoſo, etiam *Dorſi* Regioni impoſito, quotidiè laboraret, & anhelaret.

Tam

Tam religiosè olim cavebant Veteres, ne intensus Calor *Renes* adureret, ut *Lumborum* Regionem laxo solummodo Linteo defenderent, ita ut Dorsum non Pectus fenestratum gererent. Affirmat *Salmasius* se plerosque vidisse qui *Calculum* in *Renibus* solummodo contraxerant, quod Mensæ adsiderent obverso ad Ignem Tergo. Alio quidem respectu *Renibus* imprimis nocet fervidior Æstus, qui tamen *Calculo*, nisi Materiam inveniat quæ apta sit concrescere, suum haud confert Symbolum. Ab Itineribus per aliquot Annos *Equus* desueverat, ita ut nec Ephippium nec Sessorem sine summa lucta & protervia admitteret, quasi rectius & levius sederet solitum & quotidianum Onus, novum autem maximè irritaret; aut provido Sensu præsagiit, si ad Iter se accingeret, Onus, quod jam quasi in Pulvinar, dum pedetentim pergit, quietum reclinabat, citatioris cursus Exagitatione graviores Cruciatus, & Molestias daturum. Id quod sæpe videre est in Hominibus *Calculum* Filamentis quibusdam in Æquilibrio suspensum diu sine magno incommodo gestari, illis autem vehementi aliquâ Lucta & contentione ruptis in collum *Vesicæ* prolapsum, unde acerrimus in tam tenera & sensili Parte Dolor, quam misera Mors excipit. Erat insuper *Equo* pro Pabulo quotidiano Fœnum aridum; herbosis & liberioribus Pascuis per aliquot Annos haud raro aut nunquam gaudebat, in quibus aut commune remedium inveniret, aut fortasse singulare aliquod seligeret, cujus Vim & Virtutem Sensus & Experientia comprobassent. Quidni enim eandem cum aliis Animalibus demus Solertiam? *Canis* Cibis distentus & gravatus sedulo discurrit, & inter mille alia peculiare suum quærit & eligit Gramen, quo Vomitu provocato *Ventriculum* Onere suo liberet & relevet; *Cervus* Sagittâ sauciatus ad suum statim festinat probatissimum in hoc casu *Dictamnum*; *Felis* sive male sive bene se habeat, *Nepetâ* suâ se relevat & recreat, quæ ideo de suo Nomine *Cattaria*, & *Mentha Felina* nuncupatur. *Equus* etiam hic bis quotannis Verno *scil.* & Autumnali tempore macrescere, & in Partibus posterioribus præcipue ita hebes & languidus fieri solebat, ut ægre & vix Pedes expediret, & post se traheret; Gravi *scil.* Onere oppressi fatiscunt Spiritus. Ita sæpe videre est Membrum aliquod graviori Ictu contusum, & Spiritibus destitutum, *Atrophiâ* tabescere, & inutile fieri pondus. Octo autem aut 10 ante Mortem dies *Urinam* minime reddidit, *Calculo* scil. ita omnem Capacitatem opplente, ut nullus daretur *Urinæ* Transitus. In Solum jam se projicit, se verberat, volvit, revolvitque, Terram Pedibus proscindit, & omni, quâ potest vehementia, acutissimi Doloris exprimi Sensum. Sed quod majus adhuc mirum est, per totum illud tempus, quo *Urina* non profluxit, etiam oblatam Aquam pertinaciter aversatus est. Quasi ex ipso Naturæ Instinctu sentiret Aquas, si non transeant, altiores assurgere, & longe graviora creare Tormina.

A Stone in the Bladder of an Ox; by Dr. Johnston. n. 101. p. 9.

LXXXIX. 1. *An.* 1671. The *Bladder* of a Fat Ox being blown by a Butcher's Servant, in *Pomphret*, there was something observed sticking to the inside with a duskish Froth. Keeping the *Bladder* half blown, the Butcher's Son who first discovered it, knocked with his Hand on the side and the Bottom of the *Bladder*, to make it settle to the Neck; and by shaking and

and ſqeezing it, got out the Froth, and about 200 little Globular *Stones* of ſeveral Sizes. He rubb'd the Slimy Froth from them, and they appeared of a duskiſh Yellow-Colour and Smooth. When dry, they were like *Seed-Pearl*, but more ſmooth, and of a perfect Gold-Colour, and ſo continued. View'd in a *Microſcope*, they appeared Poliſh'd, and without any Rugoſities. The Figure in moſt was Sphærical; in ſome a little compreſſed; the Colour like *Burniſht-Gold*. I broke one or two of them with ſome difficulty, and I found, by the *Microſcope*, that it was only a thin Shell that was ſo *Orient* and bright, the inner ſide of which Shell was like Unpoliſh'd Gold. The inmoſt Subſtance was like brown Sugar-candy to the naked Eye, but not ſo tranſparent. The Taſt was not diſcernable. In *Spirit* of *Vitriol* they ſhrunk much and waſted, but continued their Colour, (poſſibly by reaſon of the outward Skin, which, it ſeems, in theſe was as difficult to Diſſolve as in true *Pearls*); Likewiſe *Aqua fortis* would Corrode and Diſſolve them tumultuouſly.

2. I did perſwade my ſelf at firſt, that theſe *Stones* were ſome Inſects Eggs: but afterwards, when I had read that Account of ſeveral *Stones* found in other Animals which Dr. *Wedelius* has publiſh'd in the *German Ephemerides*, *An.* 1672. I was induc'd to believe them *Stones* indeed. *By Dr.* M. Liſter, *Ibid.*

XC. 1. *Margareta Lauvera*, noſtra Concivis, modeſtè vivens, Anno Periodi ſuæ 21, qui Seculi fuit 1678, tempore Verno Menſtruis deficientibus incidit in varios Cruciatus acerbiſſimoſque Dolores, hinc inde jam ſupernas, jam infernas, jam Dextras, jam Siniſtras Corporis Partes infeſtantes, variis ſubito ſæpius ad Palmæ Latitudinem erumpentibus Veſicis, Limpidâ plenis, ardentiſſimèque flagrantibus, ut Ignem Sacrum ſubeſſe putares; & cito niſi diffecarentur, evaſit Dolor intolerabilis, mentemque deturbans. Moxque ſedatis ex unâ ſit Eruptio ex alterâ parte. In his mitigandis & curandis cum detenti in *Noſocomio* Clementiſſimi Magiſtratus (*Inſula* dicto) omnem operam cuncti navaremus, Cauſam tanti mali ad Acrimoniam *Lymphatici* Humoris ſingularem, & vim illi in Glandulis ſubcutaneis Stypticam impreſſam, ideoque coagulatum refluere non potentem referentes, quæcunque Ars & Methodus docent in Demulcendo, Diſſolvendo, Avertendo & Vacuando iſto Humore adhibebamus, pleraque fruſtrà; dum tandem ratione & analogiâ ducti ad Ptyaliſmum Mercurialem confugimus, cujus effectus reſpondit: Sicque poſt Octimeſtrem Curam Menſe *Martio An.* 1679. è *Noſocomio* viribus reſtitutis dimiſſa ad uſum Seri Lactis Caprilli Chalybeati relegebatur. *A prodigious Number of* Stones *voided by a Woman at* Bern *in* Switzerland; *by Dr.* Sigiſm. Konig. *Ph. Col.* n. 3. p. 68.

Ab hinc integrè valuit ad tertiam *Januarii An.* 1680. omnibus Functionibus ſuis incumbens, quâ ipſa Veſicarum Eruptione iterum vexari, auxiliatriceſque ac benificas manus ſummi Magiſtratus in *Noſocomio* expetere cæpit, quæ ejuſdem quintâ porrectæ, omnis cardo in eo verſabatur, ut præcedenti Methodo de Ptyaliſmo inniteremur; ſed omnibus ante opus eſſe voluit ad ejuſmodi majorum & arduorum Remediorum uſum Corpus diſponere, in quod intenti non tamen mota Catharſi, fit momentanea à Circumferentia in Centrum, ab exterioribus in ima Penetralia 15. dicti *Menſis*, Humorum reductio; ſubito omnes evaneſcunt Veſicæ, adeò arctè Cuti ſe infigit Cuticula, ne

ne Veſtigia præcedentium permanſerint, ex qua veloci Revulſione cūm nihil boni Ominatus, etſi ægrota Deo Hymnum cantaret pro Divina ſubitanea è ſummis Cruciatibus Liberatione, ſed decubitum acrium Humorum in Viſcus aliquod Nobile veritus, licet 5 dies εὐφοείαν ſummam Ægra percipiebat, nuſquam tamen deſtiti Diſcutientia & Diaphoretica temperata propinare Recidivæ vel majoris Mali metu.

Evenit 20. hujus lerna malorum & omnis Judicii Illuſio, querebatur Dolorem *Lumborum*, *Veſicæ*, *Perinæi* & *Inguinum*, cum Virium Proſtratione, Inappetentia, Nauſea, notabili Inflammatione, & Sanguinis ἐντυεία, Retentione *Urinæ*, *Pulſu* celeri & intercepto, unde *Nephritidem* concludere erat neceſſe: quapropter Sectâ Venâ præparatur ex *Nephriticis* & frigidis Seminibus blanda Emulſio, injicitur Cliſma ex mollientibus frigidis Paregoricis, mox injectum, omnium ſtupore, Horæ intra quadrantem rejicitur per Os; repetitur idem, & ſupernè rejicitur idem cum quantitate inſtar *Tophi Lapillorum* ad *Unciam* Semis, nullis unquam Excrementis permixtis. Fiunt Inſeſſus, Semicupia, applicantur Veſicatoria Artubus ad Humoris noxii Revulſionem, Anodyna & reſolventia *Lumbis & Pubi*; repetitur ob æſtuantia Viſcera Venæſectio, Sanguis apparet rubicundus, inſipidus, cum pauco Sero ſubflavo, citò concretus; remittit Febris; propinantur ex Pulpis decocta Solutiva, quæ tamen cuncta cum Juſculis aut aliis aſſumptis Vomendo, quantitatem *Lapidum* mox duriorum inſtar *Silicis*, & Fruſta Corticum *Marmori Albo* ſimillima duriſſima, rejecit. Iterum tranſitur ad Cliſmata pari ut dictum Succeſſu per ſuperiora, niſi quod quantitas *Lapidum* excretorum augeretur, & ut priores exigui Piſorum inſtar, hi *Avellanas* minores Nuces, quas tamen mox excedebant, magnitudine æquabant. *Veſica* ſumma Dolore mejendique deſiderio premebatur, applicato *Cathetere* ne Gutta fluxit, inhærebat ipſe velut Glutini infixus, ut vi retrahi debuerit, nobiſque tangentibus *Veſicam* Muco repletam declaravit. Suſpicabamur non immeritò in *Renibus* & *Veſica* Glanduliſque *Meſenterii* generari *Calculos*, prout in *Ventriculo* & *Inteſtinis* αὐτοψία docuit. *Venter* in aliquam, non tamen nimiam, molem cum oppreſſione Precordiorum & ſpirandi difficultate intumuerat, acutiſſimum Dolorem pungentem & lancinantem in Regione dextri *Renis*, & Siniſtri *Hypochondrii* ferens, Fragor invicem allidentium *Lapidum* vel admotâ manu vel citato Vomitu audiebatur, ac in enixu ſæpius obſervatum *Lapillos* confractos ab aliis intus reſtantibus avulſos eſſe; ſed quod maximum eſt, toto durante Morbo, Ægra εὐσαρκὴ, benè Colorata, facie florida, manſit. Nitebamur itaque omni nervo Humorum Concretionem impedire, & Concretos diſſolvere, varia *Menſtrua* quærentes in Volatilibus Martiatis, & Urinoſis, ſed extra *Spiritum Nitri*, in Uſum vocatum, nullum Diſſolutione efficax eſſe potuit; & his juxta alia Auxilia adhibitis, ut injectione in *Veſicam* ex variis Decoctis, tam de Mineralibus quam expreſſis Plantarum Succis, Perſicariæ, &c. ad Mucoſæ illius Subſtantiæ in *Veſica* Diſſolutionem, nil tamen obtinere; ſed mox Anodynis ob exquiſitiſſimum Senſum, mirum in iſto Muco, concurrere neceſſe habuimus. Tandem 2. & 12 *Feb.* extrahebantur *Cathetere* circiter *Urinæ* Viridis & Craſſæ *Unciæ* 4; Cibus abhinc paucus, nullaque Sitis urgebat. Interim cum unum alterumve Cochlear Juris Carnium vel Hordeati,

Hordeati, aut alterius ſorbilis Medicamentivi caperet, repentè Revomit de die bis, ter, *Lapillorum* circiter *Unciam* Semis ad *Drachmas* 6, plus minus, ad 14 uſque. A qua ad 16. *Jun.* elapſos 4 Menſes, nec Edit nec Bibit, ſed quam primum ſolum Cochlear Brodii propinaretur, ſtatim Vomitu, Cruento exſpuit *Lapillorum* majorem quàm antea copiam, ut Cruciatus contra ipſius Voluntatem irritando omni offerendo Cibo Potuque abſtinere hoc tempore debuimus. Manſit itaque Ægra totum Quadrimeſtre Abſtemia, non Edens, non Bibens, non ſumens Remedii quicquam, quam quinto ſextove die Cochlear exiguum Olei *Amygdalarum* Dulcium *Spiritu Nitri* imprægnatum, quod optimum ſolvens in hoc Affectu repertum, Ægræque ſupra alia, Remedii genus acceptum erat, ut Uncias novem ad decem hoc integro tempore adſumpſerit. *Alvus* hactenus Conſtricta manens, quum varie Clyſmatibus tentaretur, ſemper ſingula Surſum rejiciebantur, *Lapillis* varii generis, Albicantibus, Ruffis, Griſeis, Aſperis, Lævioribus, Mollioribus, Durioribuſve magna mole comitantibus, mox homogeneis uniuſque Subſtantiæ, *Tophis*, *Silicibus*, Cruſtis *Marmoreis*, mox heterogeneis, compoſitis ex *Cemento* cum *Silicibus*; horum alii cum Cruore, alii Muco Chyloſo obducti, alii omni aliena admiſtione immunes excernebantur; Dyſuria premebat, ſed non niſi de Decima ad Duodecimam mane, licet tertia quavis die *Catheter* injectus, ad *Uncias* duas, vel tres pro vice ad ſummum, Mucoſæ & viridis *Urinæ* elici poſſit; cum alius Liquor, quam qui per Clyſmata, ſuppeditatus non fuerit. Attamen his intermediis nullo immutato neque in Victu, cum nullum ſumpſiſſet, neque in Remedio, cum aliud tolerare non poſſet, & *Urina* 6. *April.* ſolveretur, *Unciæ* tres fluxerunt Cæruleæ Tranſlucidæ & Tenues, ſaturatè Coloratæ, nec vero ultra durarunt; ſiquidem 17. *Urina* iterum Subviridis & media parte diſſoluto Sabulo Griſeo impleta Matula apparuit, unde diſſolutio *Tartari* Argumentum mox evaneſcens, cum Symptomata Dolorque adeo ingraveſcerent, ut Mentem ſede moverent, hinc Deliria, mox Stupor, Riſus & Cantilenæ, Febris abſque Senſu, mox atrociſſimus *Lumborum* Dolor, ut de Punctione conquerenti ſi Cultellus Ægræ admiſſus fuiſſet, ipſa intrudiſſet. Tandem his Symptomatibus, perverſis Capiti, rati ſumus, quocunque modo illud Corpus movere, quapropter *Gr.* ij. *Mercurii Vitæ* in Aqua frigida fontana ſoluti, 29. *Aprilis*, ut & *Gr.* iij. 2. *Maii* propinavi, non alio Succeſſu quam quod *Drachmas* 7 *Lapillorum* duobus motibus Evomuerit. Inde Octavâ *Mercurii Vivi* in tanta *Alvi* Conſtipatione *Uncias* quatuor, & ad Solutionem *Tartareæ* Materiæ, & excitandum *Ptyaliſmum*, ut & 10. ejuſdem, *Uncias* 6 propinavi, ſed præterlapſus *Mercurius*, *Anumque* excidens, partim in Lecto, partim in Hypocauſto, recolligebatur, cujus quantitatem per *Inteſtina* circulati mecum reſervo. Quid ultra? Sic Vita agebatur Abſtemia ad 16. *Junii*, qua *Inteſtina* Aquâ frigidâ eluere magna quantitate, in quo *Sal Polycreſtum* ſolutum, ſtatui, duas horas Lecto me applicui, de quadrante in quadrantem *Uncias* 6 propinando, ſic ut *Libras* 3 Fontanæ biberit, Os ipſi comprimens, Vomitumque cohibens effeci, ut ſub Veſperam ſubſequuta ſit craſſiſſimorum juxta & Duriſſimorum Alvi Excrementorum Dejectio, ad metum Ruptionis tantopere *Anum* diſtendentium, ſic quod integris 4. Menſibus variè & incaſſum Remediis tentatum, una Aqua Fontana

omnia solvit, Hic *Deliria* remiserunt & Appetitus resuscitatus : Ergo ad Aquæ Simplicis Acidularumque Usum Balneaque transgressum, tertia Die omnino reluctante iterum Natura abstinuimus. Interim in *Novembrem* Alvi dejectio 5, 6 que Die pauca sed libera erat intercidente Vomitu, adeo ut *Calculi* jam supernè & infernè dejicerentur, tantæ magnitudinis sæpius unus alterque *Drachmas* duas non modo ponderabat, sed excedebat, quorum copia penes me ; & facile conjicere est non absque Cruore, Asperos illos & Acuminatos *Lapillos*, summoque Dolore dejici potuisse. Hoc intermedio tempore, *Septembris* quippe Mense, cum ab eo quo rursus Cibum licet paucum caperet, Remediis Aperitivis, Diureticis, Emmenagogis, ac Diaphoreticis, non destitissem, Menses ardentesque Vesicæ quales prius erupere : Unde Spes λύσεως & μετασάσεως affulsit, ni cito omnia evanuissent hactenus irreconciliabilia. Cumque ab hinc ad quintam *Novembris* Natura in sua μεταμορφώσει nihil immutasset, *Alvus* iterum constipari, *Cordis* Vires opprimi, omniaque inversa viderentur, & ipsa prius in *Intestinis* recondita Excrementa sursum rejicerentur, Spes omnis convalescentiæ cessit, sed Divinâ Gratiâ motus hic non nisi quinta, nona, & quinta-decima *Novembris* contigit, dum Decocto Solutivo ex Pulpis Natura immutasset ; reducta in priorem Statum *Alvo*, *Urina* semper suppressa, cum summa necessitas urgeret, 4 *Februarii An.* 1681, injectus *Catheter* nihil eduxit, sed mox expetita Matulâ Ægra *Urinæ* Subviridis & fæculentæ nixu Parturientis omnium admiratione capta *Lib.* 8. absque ullo tamen *Calculo* eminxit ; à quo *Vesica* plane recluſa, loco Descensus altero tertiove die *Urinæ* graveolentis quantitatem *Unciarum* iij. vel iv. ad 16 *Maii*, ore dejecit, A qua ad 2. *Calend. Octob.* cum Balneis Fontanæque largo Potu, *Nitri Spiritu* permixto, uteretur, res eo devenit, ut Facie floridâ incedere queat, modice comedat, *Urinam* singulas Claram, Subflavam, cum tenui Hypostasi, aliquando Mucosim, & Cruentam ad ʒiij. vel ʒv. *Alvum* vero 4 die sed Paucam Duramque deponat, subinde Vomat, sed minorem longe quàm antea *Lapidum* quantitatem. Interim quod Onus Natura *Oesophago* excreverat, nunc quoque *Vesica* sæpius Acutissimum *Lapillum* excernendo reddit ; *Abdomen* aliquantum, duritie in Sinistro *Hypochondrio*, Dextraque *Lumborum* Regione dolente remanente, Tumens, Contrectatum, Obtusum Strepitum allidentium *Lapidum* edit.

n. 181. p. 94. Ab eo tempore Ægra nostra moderatè vixit, satque bene Naturæ Functionibus in Excipiendis & Excernendis occupatis, ad decimam octavam *Augusti* 1682, qua Torqueri, Nauseaque & Singultu absque tamen Vomitu agitari cœpit : dato Cardiaco cum *Spiritu Nitri* Dulci ad 29. dicti Mensis cessarunt Symptomata ; hac vero superioris & inferioris *Ventris* Cruciatibus summis angi, in Latera volvi, Respiratione impediri, *Hysterico* Paroxysmo infestari ; cum Ructibus *Cordis* Palpitatione & Oscitatione visa ; Occurrebatur Anodynis & Antispasmodicis (omissis Clysteribus, quorum Usum Ægra ob Intestinalis motus Inversionem valdè horrebat.) Succedebant Expansiones & Jactationes Artuum, Motus Convulsivi totius *Abdominis*, Constrictio Musculorum *Laryngis* & Faucium cum Aphonia, tandemque Parturientis Dolor Sibilo alto se dictitans, quo contractis omnibus Membris, Alvo dejecit insequenti 30. *Calculum* ; Cruore conspersum ; cujus Enixum sequebatur altera die duo minores longe,

longe, cum Hæmorrhoidali Fluxu, dilaceratis Vaſis: poſt hac inſtar Puerperæ habita, Juſculis reſtaurata, Remediis ſublevata, convaluit, intraque Septimanas paucas, reſoluta jam quaſi Natura, ad Actiones obeundas vires collegit.

Hæc rerum Triſtis Facies & Viciſſitudo, hic Ægræ Status, ab ultimis præteritorum tolerabilior, in Dolorificum verſus: *Calculi* non tantum majoris Ponderis, ſed & durioris Subſtantiæ, valdeque Anguloſi, nec ſingulis Digeſtionibus, ſed velut in quadam Matrice matureſcentes abrupti pelluntur tertiâ quartâve Septimana Infernè, nec ulterius Supernè excluduntur: *Alvus* prius libera demum adſtringi incipit, & una alterave à Conſtrictione Die *Lapidem* parturit: *Urinam* è *Veſica* reddit paucam, Potui in quantitate non reſpondentem, variam, plurimum craſſam & turbidam, quæ raro Supprimitur, Suppreſſam Emingendo antecedit *Calculus* Fabæ magnitudine majoris, Anguloſus, cæteriſque per omnia ſimilis: Et quod antehac per Intervalla, nunc Quotidie contingit, mane dum *Urinandi* motus urgeret, quantitate aliqua fluente per *Veſicam* prius, nullo vel exiguo Intervallo, altera Vomitu decedit ad *Uncias* tres vel quatuor, ejuſdem Coloris, Conſiſtentiæ, Odoris Urinoſi, & ex Ægræ relatione, multifaria cum Nauſea, Saporis; quæcunque clarius in Spagyrico Examine apparuêre. Tumet *Abdomen* nec ſolum ut ante in Siniſtro *Hypochondrio* durities, *Lapidumque* allidentium Sonitus, ſed in tota *Ventris* Dextra Regione aliquando profundius ob Muſculorum Laxitatem ſentitur, magnumque Dolorem circa *Hypogaſtrium* queritur. Appetit Cibum Potumve modicè qui ex Radice *Glycyrrhizæ* Graminis & *Hordeo* uſualis eſt, perque vices aliquid Vini Tenuioris conceditur. Dormiendo ſubſultat: Fluunt *Menſes* rarius & parcius, nec tamen deſiſtunt: *Pulſum* habet & Languidum, & Celerem, & Profundum, & Interceptum, pro variis Symptomatibus variantem: *Reſpiratio* Liberior, non Valida ſed Senſu vix preceptibilis: Menteque plus nunquam movetur. Tandem 12 *Dec. An.* 1685. Tibia dextra Gangræna ad Palmæ latitudinem correpta Scarificatione cæteriſque neceſſariis curata; nunc Angina notha, ob Tonſillarum Inflammationem premitur: plurimumque Arterioſi Sanguinis è Faucibus fluit, majoris forſan excernendi *Lapidis* Prodromus: Revulſionem per Phlebotomiam in Pede & Clyſmata tentatam ſecuta fuit 20 *Febr.* Dejectio Fæcum Naturalium per inferiora; 23. vero & Dejectio fæculenta & Rejectio per Fauces oleoſæ Clyſmatis Subſtantiæ, cum Fetore abſque *Lapillis*; unde imminens Suffocationis metus abſtinere juſſit.

Hic Caſus Rarus & Mirus varia Ingenia ſuſcitavit. *Calculos* in Humano Corpore, ad Macrocoſmi Leges, ex Principiis Activis, Vinculo *Salino*, cum Matrice Terra & Phlegmate, diverſimode concreſcere docet Analyſis; Inque *Glandulosis* Partibus Corporiſque *Ductibus* generari nihil ignoti, quod graviſſimi Authores teſtantur, noſtraque Obſervatione conſtat, præter *Renum Veſicæque Calculos*, An. Seculi 1677. *Catarinam Scertenleib* Puellam, Excretis tuſſiendo plurimis *Lapillis Tophaceis*, in *Noſocomio* noſtro Pthyſi occubuiſſe; è contra Sabulo multaque Pituita Gypſea in *Inteſtinis* concreta varie dejecta, *Catarinam Blaſeram* An. 1680. in eodem *Hoſpitio* integre reſtituram eſſe. Virum Amp. D. *Jo. W.* majoris *Senatorii* Ordinis, Arthriticum Mense

Julio An. 1683. utroque *Uretere Calculis* obſtructo, ab impedita Mictione, 17 Morbi die, non juvantibus variis Seri Vacuationibus, Phlebotomiis & Lithontripticis, *Apoplexia* obiiſſe ; quos *Lapides*, alterius longè a noſtræ Ægrotæ ſubſtantia, nulloque *Acido Spiritu* ob oleoſam Imprægnationem ſolubiles, extraxi ; *Ren* Sinifter naturali duplo, Dexter vero triplo major, dilatatis Tunicis, multo Sero tumidi ſcatebant, plurimis obhærentibus *Lapillis* Ruffis, Aſperis, cum ex *Ureteribus* ſecti eſſent Apice rotundo, forſan Lævigato in Ductu, & forma Glandis Quercus minoris: Nuperiſque è tonſillis Puellæ *Mariæ Haffneriæ* ad 32 *Tophos* ſecuit Civitatis hujus Chirurgus expertiſſimus D. *Albertus Baurenkoningius* : Inſuper à Clariſſimo Dn. Doctore *Sclareo* Hiſtoria communicata de *Calculis* Felleis raræ magnitudinis pro anguſtia ductus *Cholidochi* ; & alia Filii *Ebræi* cujuſdam, 11 Annorum, *Weinhemii* in *Palatinatu* degentis, *Lapillos* diverſi generis, immo *Silices*, per *Virgam Anumque* excernentis, ab Urbis *Heidelbergæ* Secretario Cl. D. *Zweifelio* mihi perſcripta.

Verum cum ſimilia viſu, reipſa plurimum diſſimilia ſint ; Phyſico Examini *Calculos* hoſce ſubjecimus,

1. *Solvendo* : Sic Spiritus *Sulphuris*, *Vitrioli*, *Acetique* affuſus, aliquem Efferveſcendi motum incipit, imprimis in iis qui *Ventriculo* excreti rarioris Texturæ friabilioriſque ſubſtantiæ ſunt ; ſed citius, *Acidis* ſuis particulis inflexos Poros ingreſſis, ſubſiſtit, nullamque Solutionem perficit. *Salis Armoniaci* Spiritus ne quicquam movet, & omni modo tentatus, veluti homogenius Subjecto ſuo, conquieſcit. Sed *Nitroſus Achilles* cuncta deſtruendo ſubegit.

2. *Diſtillando*, per *Retortam* : *Oeſophago* excreti Salis Volatilis cum Spiritu & Phlegmate paucum, Terræ plurimum, Saliſque Fixi fere nihil ; Poſteriores *Alvo* redditi, cum iis ex *Veſica* ejuſdem Figuræ & Subſtantiæ, plus Volatilis, cum pauco ad Guſtum ſubacido Phlegmate, ſed Spiritu Urinoſo forti, modicum Fixi ſalis ac plurimum Terræ habebant. *Calculorum* horum *Unciæ* ſex exhibuerunt Capitis Mortui *Uncias* 5. cum *Drachmis* duabus, & ex his Salis Lixivioſi vix *Scrupulum* cum Dimidio, Phlegmatis cum Spiritu & immiſto Sale Volatili *Drachmas* 5. & ſemis, adhærente quadam portione *Recipientis* Lateribus : Hic Liquor junctim ſumptus, addito *Spiritus Vini Alkaliſati* quanto, in *Alembico* exiguo Caloris gradu ſublimatus, depoſuit in Capite Salis Volatilis Urinoſi *Scrupulos* duos & ſemis. Olei nihil conceptum niſi Volatilium fluorem Salium eo referre velimus.

3. *Præcipitando* : Liquor Diſtillatus Spiritus *Vitrioli* additamento in rubram Tincturam vertitur, tandemque craſſior evadens quodammodo ſecedit in Fundum ; Affuſus vero idem Spiritus à *Diſtillatione* reſiduo Capiti Mortuo, aut Sali inde Elixiviato, non aliam quam cum *Sale* & *Oleo Tartari* impetuoſam efferveſcentiam excitat.

Sic *Lapides* noſtri conſtant plurima Terra, Sale Vol. exiguo, Acido perpauco, quod Sale Spirituque Urinoſo Infractum & Edulcoratum eſſe, *Spiritus Armoniaci* ejuſdem Naturæ demonſtrat, *Acidorum* partibus immixtus eas Retundendo & Implicando in dulcem Saporem cogit, poſt non reſolubiles.

Exin concludimus Salium Lixivioſorum Naturam à *Salis Tartari* non rece-

recedere in Ægra noſtra; & reperta Matrice, incorporandi Subjecto accedente *Acido*, motum (effervescentia aliqua prægreſſa) invicem ſiſti, inque *Calculos* hoſce coire; prout *Vitrioli Spiritus* Particulis ſuis acutiſſimis & flexibilibus (unde Oleoſus tangitur) *Sal Tartari* penetrando quidem deſtruit, ſed deſtructam in ſui Naturam aliter colligando cogit: In hiſce *Calculis*, ut jam ad ſuam Craſin diſpoſitis, nil præſtitit; verum Sal Fixum, Igne ſublatis implicandi Spiritibus, in ſuam Naturam reduxit, ex qua Coagulum conſtat. E contra, *Nitri Spiritus*, *Acidus* quidem, ſed ob ſubtiliſſimi Salis Conjunctionem particulis Rigidioribus, Penetrantiſſimis, Inſeparabilibus conſtans, non tantum una Qualitate cuncta Solvebat, ſed & altera Reunionem impediebat; cum particulæ hujus Rigidiores, in actu continuæ, ſeſe flectere, Saliaque diviſa in alienam Naturam combinare non valuerint.

Spiritus vero *Salis Armoniaci Urinoſus*, Salibus iſtis Volatilibus conſimilis, ex Fixis productus, illam non modo Quieta reliquit, ſed & hæc ut Gremium ſuum amplexus.

Hinc longè alia *Calculorum* horum generandi ratio & locus quam eorum qui abs *Renibus* excluduntur; cum hi è particulis Seri Rigidioribus, vel ad Pororum *Renalium* relationem Craſſioribus, ſenſim obhærentibus eoſque obliterantibus contexentur; Lubrica quidem Aqua Flexibilibus particulis decidat, Salia vero Sero innatantia Volatilia inſenſibiliter Reticulo huic implicentur, tandemque in *Lapideam* duritiem accreſcant; Quod prius communi Experientia conſtans exhibet Senes, quibus Craſſiores Humores, minuſque meabiles Meatus contingunt, in hunc Affectum valde pronos; Poſterius *Diſtillatione* firmatur, etenim imminuendo ejuſmodi *Calculos* donec Collum anguſtum *Retortæ* ingrediantur, prodit Spiritus Urinoſus cum Sale Volatili multo & aliquo Oleo, remanentque in Fundo *Retortæ* non commotæ Figuræ *Lapidum*, quæ in Cineres commovendo decidunt, quæque rurſus affuſo Diſtillato Liquore in *Calculos* conjunguntur: ex quibus Salis Volatilis copia & implicandi modus in his optime conſtant.

Qualiter vero & ubi in Ægra noſtra generentur *Lapilli* & *Tophi Tartarei*, (ea in Vivis) vix eſſet hujus loci & temporis divinare, niſi rationi aliquid concedendum foret.

Veſicas ſub *Epidermide*, limpido Sero flagrantes, ibique ob impeditam *Cuticulæ* tranſpirationem Obſtructoſque Glandularum ſubcutanearum Poros denegantes refluxum collecto, Sanguini Pellenti non vero Quieto ortum debent; cum hic à tempore quo coagulari viſus eſt, nuſquam Ampullas ſuſcitavit, & ſecus motui contrarium eſſet: Mordax vero lancinanſque Humoris qualitas atque inſpiſſatio ſingularis, *Acidi* in Corpore prædominantis argumentum; cujus rimari naturam difficile, cum leviſſima additione vel detractione Motuve Humores alterentur, ut ex *Chylo Sanguis*, ex *Sero Lympha*, ex *Aqua-Forti Regia*, generentur, aliiſve Naturalibus cernere evidens eſt. Qui Humores in receptaculis ſuis Glanduloſis, ut locis Natalitiis, varie & perverſim alterati tantas Coagulationes efficient, cum ſtagnantes exhalato *Alkali* Spirituoſo inſpiſſantur & aceſcunt; haud ſecus ac Analogum Sanguini *Vinum*, quod evanidis *Sulphuris* particulis quibuſdam Acidæ incorporatæ hærebant, relictis his, in Acorem vertitur: Et certe Dulcis Acidique ratio

non

non alia eſt, quam diverſimoda major minorve Acutarum partium cum aliis commixtio, actuſque retardatio, ut in *Saccharo*, *Melle*, *&c.* Hinc Sanguis, etſi tandem in Inſpiſſatus, tamen Dulcis Linguæ occurrit: immo pro Tactus ratione magis minuſve feriunt, parva inter Titillationem & Dolorem Diſtantia. Merito ergo *Glandulæ*, præprimis Inferioris *Ventris*, Seri *Lymphatici* (vel Pituitæ in hoc Acidæ) Receptacula & Ergaſtula, in vitio occurrunt, quo Humor, jam Heterogeneus Ductibus ſuis haud exoneratus, atque è *Pancreate* in *Duodenum* longo Intervallo non ſolutus, Acidior evaſit: Hinc prior hiſce præ *Utero* attribuenda Mali labes, (cum naturaliter abſque Imprægnatione, *Menſium* ſuppreſſio ante Annos ſenectutis, nulla contingat) quæ in hoc Corpore primos Effectus latentes ederit, unde reſtagnans Sanguis majorem Corruptionem, majoreſque Turbas fovebat; non enim ſubordinatæ Cauſæ pugnant.

Subita vero *Veſicarum Evaneſcentia* ad Remedia Reſolventia Volatilia commode refertur, quibus Obſtructiones univerſi reſerare nitebamur; factum unde ut una cum Meatibus Glanduloſis patefactis non modo refluxus reſoluto Humori datus, ſed & magnum Pituitæ receptaculum *Pancreas*, impetu in *Inteſtina* & ab hinc Maſſam *Chyli* viſcoſam, indeque *Sanguinis* Univerſam, Humorem contentum Acidum effuderit, ſicque Diatheſin parvam hucuſque continuatam induxerit: Qui *Chylus* juxta Principia ſua alius vix ſtatui poteſt, Ægra adhuc inſanis magno Aquarum Potui ad juvenilem *Viſcerum* æſtuantium Calorem Supprimendum dedita; Aquis etſi in hac Urbe Saluberrimis in Subjecto capaci evidentem Cauſam non detrahimus, ex qua conſequens obſtructio *Ductuum Glandularumve* concinnari potuit: Quantum vero vel an contribuat *Bilis* in *Petrificatione* hac vix invenire eſt, cum hæc aliter ac noſtri *Calculi* Sale Lixivioſo redundet. Hinc *Ventriculus*, *Inteſtina*, *Glandulæ*, Primarii generationis loci, quamvis & in *Veſica* ſecundario procreentur: Latex quippe Urinoſus primæ Digeſtionis vitio ita inquinatus, ſecundæ excrementum, multo Acido, Saleque & Craſſo Phlegmate imbutus, in *Veſica* ſtagnans, in Coagulum invicem accedentibus particulis aptis coivit; unde & Mucus & *Calculi* abſque alterius rei acceſſu vel diſſipationis ſpe.

Quatenus vero ante, *Silices* exiguos variaque Cæmenta evomuerit, cum abhinc Vomitu nihil excreverit, Cauſa diliteſcit in Corpore; Aquarum tamen pro ratione Subjecti occupati diverſa, diverſa eſt *Lapides* producendi & incorporandi vis.

Pondus Specimina probant; non enim deſiſtente Agendi vi in Subjecto diſpoſito Effectus continuantur, ut 10 hactenus *Libras* ſuperarint. Alienæ à *Podagricorum Tophis* Subſtantiæ primos *Ventriculo* excretos, rariioris compacturæ, Aer non ut Salia humectando cum minima haberent in Fluorem, ſed rariores minuſque firmiter implexos Angulos movendo inſenſibiliter contritos, in pollinem redegit; quemadmodum in *Vitriolo Albo*, Lignis corruptis exſuccis, aliiſque ab Aere contingere videmus; contra vero *Vini Spiritus Rectificatus* raros Poros facillime intrans, nec Aeris inſtar vibrans, Fibrillas Quietas ſuſtinebat.

Motus

Motus Naturam esse renitente Objecto circulare vermiculariter at retrogradè in nostro Subjecto, patet, majoribus *Lapillis* ad angusti portam intra exitum *Ilii* & principium *Coli* circa *Cæcum* obhærentibus, retractis Orbicularibus musculosis *Intestinorum* Fibris, *Peristaltici* Motus Inversionem contigisse, causam vero tam violentam ut *Calculorum*, facile Valvulam aut inepram eversisse, aut plane dirupisse. Hoc Ostio patente, quidni stimulata *Intestina* Clysmata sursum absque Excrementis durissimis rejecerint? Cum Scybala videamus in *Colicis* adeo indurata Cellulis inhærere, tandemque ad *Alvum* descendere, ut vix Coctione solvi, multoque minus Clysmate dilui possint; Æque quidem mirum hæc contigisse & etiamnum contingere in fartis Ductibus crassioribus *Lapillis*, verum ad horum Figuræ Varietatem spectantes, eos non ad *Intestinorum* Cavitatem conformari, sed ubique lateraliter, immo in aliquibus per ipsa quibus perforantur Foramina, *Chylo* Descensum & Clysmatibus Ascensum concedere.

Urinosi Laticis Colorem varie immutari, Substantiamve alterari, pro accedentis vel deficientis ratione, quemvis Dies docet; Cæruleæ vero pellucidæ contra Naturæ Ordinem succedentis cum tempore alia est perquirenda ratio; illis enim magis minusve *Bile* saturatis intenditur vel remittitur Tinctura, aut admixtis variis Heterogeneis, vel Spiritibus Exhalatis incrassatur, inque opacam & virulentam vertitur *Urina*.

Cujus collectæ excretionem impediebat Mucus in *Vesica*, ejus Collum glutinans, tantam vero 8 *Librarum* quantitatem *Vesica* capere incapax, nisi non-naturalem Extensionem ei concedamus; qualem in Puella sub finem *An.* 1672, *Johanna Heuschleria* observavi; ad quam ut *Asciticam* accersitus, quærenti causas obtigit Inflammatio Colli *Vesicæ*, Anodyna & post *Catheterem* applicari jussi, unde incredibilis *Lotii* quantitas *Libras* 9. superans, subsidente *Ventre*, continuo fluxit, ipsaque convaluit; *Urinas* vero non tam in *Vesica* quam *Renibus*, Vasisque cæteris redundare superius Exemplum Dn. *J. W.* declarat. Evenire unde potuit ut excedens hujus Laticis *Urinosi* Quantitas apertis *Cæliacæ* Ostiolis in Cavitatem *Ventriculi* exudarit, verum propius Observantibus constat, *Urina* non redundante ejusmodi fieri vacuationem, plurimum Puram, aliquando vero quibusdam Chyli Ciborumque Particulis Mixtam; Nec si quis antecedentem Historiam serio examinabit, ne quicquam Excretiones ante primas Ægræ ingestum, multo minus huscusque datum intelliget, quod Urinosum Saporem inducere valuerit; nec Latex semper Redundans Vasa Sanguifera eructare cogit: Inde ex ipsius rei contingentibus veris aliquid contra Naturæ Leges in hoc Corpore contingere conjicere licet, forsanque continuatæ *Calculorum* generationis aliqua causa petenda, cum *Ventriculus* nova Saburra perversoque Fermento Humorum quotidie tentetur; secus jam jam Remediis alteratus esset: Memor quidem Exempli quod mihi contigit, *An.* 1677. in *Eva Zubera* Annorum 40, Cive Urbis hujus, quæ enixu Partus violento, *Vesica Urina* distenta, Fœtus exitu valide compressa, hâcque violenta causa aperto *Uracho*, *Urinæ* per *Umbilicum* integro Puerperio majorem portionem exoneravit; demum consolidato hoc, naturaliter fluxit. Ast à Naturalibus & Manifestis ad Non-naturalia Occulta hactenus concludendum non est.

Absti-

Abſtinentiæ thema *Lentulus* noſter ad Divum *Jacobum Primum*, Regem *Angliæ* Potentiſſimum pertractavit, ignota tum *Tranſpirationis* hujuſque principii *Circulationis* cauſa, varie Ratiocinatus; ſed ad hanc reflectentes, hominem *Reſpirare*, adque Subſtantiæ deperditæ Reſtaurationem refici, Ars *Statica* docet plus inſenſibiliter è corpore excerni Tranſpirando, quam per omnes Excretorias Vias ſenſibiliter excludi. Ut Vir Robuſtus in Actione permanens, 8 *Librarum* Potu Ciboque ſingulis diebus ſaturatus, Tres tantum vel in ſummum 4 *Lib.* manifeſtis in Excrementis deponat, facta tamen Digeſtione amplius non ponderet quam Cibum ante ſumptum: Hinc *Coctionum* Energia omnia imminui, inque Spiritus tandem reſolvi, & Tranſpirationis, in ſolutione Morborum inſenſibili & *Hecticorum* devorata Subſtantia, veritas conſiſtit; qua non ob *Epidermidis* conſtipationem procedente, non opus erat *Refectione*; ſecus Aer Inſpirari ad Spirituum Vitalium Refectionem debuit, ut Expirari poſſit, ſicque in Motu manere; qui ipſe Aer Inſpiratus, Incraſſatus, in Vaſis in *Serum* verſus, *Urinandi* materiam tempore *Abſtinentiæ* commodam præbuit, ut *Hydropicos* ſæpius cernimus ſolo Aere, aquoſis ſuis particulis, increſcere.

An Examen of theſe Stones; *by Dr.* Fred. Slare. *Ib. p.* 103. *n.* 182. *p.* 140.

2. Two of theſe *Stones* being ſent to the *Royal Society* by Dr. *Sig. Konig* from *Bern*; in order to the better Inquiry into the Nature of this *Helvetian Concretion*, I made it my firſt Attempt to compare it with its *Relative Pondus* to *Water*, having ſatisfy'd my ſelf that there is a *Standard* of *Gravity* ſo competent to all Real *Stones*, that where they decline from this *Standard* we have good Reaſon to queſtion thoſe Concretions whether they are *Stones* or no. The *Standard* of *Gravity* for Real *Stones*, I find to be generally about 2 to 1 of *Water* and a little more, This Concretion was very Hard and ſeemingly Heavy, but it was really very Spungy; for when it lay under *Water* there paſs'd a good while before I could clear it of the lurking Bubbles, ſo that it grew Heavyer from time to time as the Bubbles were expell'd, and at laſt arriv'd near the *Standard* of a true *Stony* Concretion, or rather ſomewhat beyond it. It weighed in the Air 12 *Dr.* 36 *Gr.* in Water 6 *Dr.* 48 *Gr.* the Difference 5 *Dr.* 48 *Gr.* therefore the Proportion betwixt this Concrete and Water proves to be as 217 to 100. This extraordinary *Pondus* gives reaſon to ſuſpect that there may be ſome Metallick Ingredient in it.

Whilſt I was making theſe Tryals, I was willing to compare this Matter with common *Chalk* which I found *Specifically* Lighter, bearing only the Proportion to Water of 180 to 100, Wherefore this Subſtance being ſo much Heavyer than *Chalk* can ſcarce be thought a Concretion of ſuch a Matter.

I then compared it with *Petrified Water*, being an Icicle that was broken off a *Grotto*, where a Petrifying Spring did furniſh enough. A piece of which, of 5 *Dr.* diſcover'd its Weight to bear the Proporton of 219 to 100, to that of Water. Our Anomalous Subſtance being ſo near the Weight of *Petrify'd Water*, would almoſt incline a Man to believe it a Real *Stone*, and the rather, becauſe we are inform'd the Patient drank much Water. Moreover, the following Experiments upon this Matter, do

do ſeem to give Proof of its being rather of the ordinary Stony Conſtitution, than of that which is proper to *Animal Concretions*. For Inſtance, we firſt of all pour'd upon it ordinary *Vinegar*, and it preſently wrought upon it with a Hiſſing Noiſe, as it did on the *Petrify'd Water* when powder'd. We pour'd on it *Spirit* of *Vitriol*, and that alſo wrought upon it and Diſſolv'd it, but let it fall again, as *Aqua-Fortis* does *Tinn* when it has Corroded it. *Spirit* of *Salt* wrought upon it very vigorouſly, and preſently Diſſolv'd it, and kept it ſo without any *Precipitation*. Theſe Experiments do alſo diſtinguiſh this Concrete (whatever it be) from the ordinary *Animal* ones, as the *Stone* in the *Bladder*, *Kidney*, the *Tophi*, &c. for theſe will not be Diſſolv'd, or in the leaſt Corroded by any of the mention'd *Acids*: Tho' *Spirit* of *Nitre* be a general *Menſtruum*, that Diſſolves them all readily. And there are ſome things yet very ſtrange, which make this Caſe peculiar: Namely, that thoſe *Stones* which are generated in the Habit of the Body, I mean in the very Serous part of the Blood, and thoſe that paſſed the *Bladder*, have juſt the ſame Nature with thoſe that are *extra Habitum*, even thoſe Evacuated *ex Stomacho* and *ex Ano*: for one as well as the other will be preſently Corroded, by ſo mild an *Acid* as plain *Vinegar*.

The Relator in his *Analyſis* of theſe *Stones*, gives an Account of ſo great a quantity of *Volatile* and *Fixt Salt* obtain'd by his *Diſtillation*, that thoſe Tryals do neceſſarily make it an *Animal* Subſtance; but that Experiment ſo far fail'd us, that I am not ſatisfy'd as to the matter of Fact: For that thoſe Concretions generated *extra Habitum*, in the *Stomach* and *Guts*, ſhould abound with *Volatile Salt* is ſtrange; for I have try'd the *Bezoar Stone*, ſaid to be generated in the *Stomachs* of ſome *Animals*, and could obtain no *Volatile Salts* from that Subſtance; though it herein agree with this Subſtance, that it is eaſily wrought on by many *Acids*.

We may in ſome meaſure Queſtion that Principle, or rather *Hypotheſis* of *Acidum*, our Correſpondent truſts to, for the Combination or Coagulation of the Humours in the Body, in order to this *Petrefaction*, it being ſuppos'd not prov'd. We may alſo Queſtion whether the *Fixt* or *Alkalizate Salt*, found in the *Caput Mortuum* after *Diſtillation*, were really pre-exiſtent in that Form in the Blood, or other Humours, and not rather a Product of the Fire.

A Further Tryal; by Dr. Fred. Slare. *Ib. p.* 145.

3. We brought this *Stone* to a groſs Powder, and conveigh'd it into a coated *Retort*, which coated *Retort* was kept for ſome Hours in a Naked Fire, ſo Hot that the Glaſs melted. The Quantity we put into the *Retort* amounted to $\frac{1}{2}$ *Ounce*, and 20 *Grains*. The Liquor that came over ſeems ſcarce to afford 3 or 4 *Drops*, which looks like *Spirit* of *Harts-Horn* Rectify'd, and ſmells much like the ſame: which plainly diſcovers it an *Animal* Subſtance, though it affords much leſs than the *Calculus Humanus* does; and by Conſequence gives us a much larger Proportion of *Caput Mortuum*, or *Reſiduum*, in the *Retort*: All which is very conſentaneous to the Nature of the *Stone*, for its *Specifick Gravity* was much Heavier than the *Stones* are we uſually find in the Humane Body; and therefore the Parts may be ſuppoſed more Fixed, or to conſiſt of fewer Volatile parts, ſuch as are

carry'd over by *Diſtillation*. We weighed the Remainder in the *Retort*, and it came to 3 *Dr.* and 50 *Gr.* 10 *Gr* of which ſeem'd to hang about the Neck of the *Retort* in the form of a dirty hard bak'd *Oyl.* The other 20 *Gr.* are partly gone off in Vapour through the *Lute*, and what we find in the *Receiver* in a Liquid Form.

We try'd part of this *Caput Mortuum* by applying Mr. *Haak*'s ſtrong *Magnet*, to enquire whether it contain'd any *Iron* Particles, but did not find any would adhere. But ſince Dr. *Liſter* has found them in much Lighter *Concretions*, as thoſe of the *Kidneys* are; and many Bodies, though not till after *Reverberation*, or a ſtrong *Calcination*, have detected an *Iron* Contexture; and even the *Marchaſite* it ſelf, though very pregnant with *Iron*, ſhews it not, till it has been *Calcin'd*; there remains yet one tryall to be made, and that is to give it a much ſtronger *Reverberation* in the Fire, and then to ſee whether ſome Particles will not prove *Martiall.*

Ib. p. 143.

Ib. p. 145.

The Production *of* Stones *in* Animals; *by Dr.* Fred. Slare. *n.* 157. *p.* 523.

XCI. 1. It is generally Obſerv'd by thoſe that have been ſubject to the *Stone* of the *Bladder*, that Pains in the *Kidneys* were antecedent, which intimates the Foundation was firſt laid there, and afterwards by the *Ureters* and a Guſh of *Urine* convey'd into the *Bladder*. The manner of its growth in the *Bladder* is obvious; the *Urine* (by ſome call'd *Lotium*) being too highly Satiated or Impregnated with a Ponderous Matter (which we here deſign to examine) Precipitates the ſame at certain times upon the mention'd Baſis, and alſo on the inward Superficies or Coat of the *Bladder*, which upon a Relaxation of their Diſtended *Fibræ*, do ſo ſtrictly embrace that Preternatural Subſtance it finds there, as to overlay it or cloath it with whatever Sediment ſubſided there.

That the *Urine* only at ſome Intervals is diſpos'd to let fall this Matter, ſeems probable from this Obſervation, that the *Concrete* conſiſts of ſeveral Spherical Superficies, or round *Incruſtations*, which like ſo many diſtinct Shells may be parted from each other. Moreover theſe *Incruſtations* are obſerv'd to be very unequal, ſome much thicker than the other: an Argument that the *Urine* continu'd much longer diſpos'd to Depoſe this *Calculous* matter at one time than at another; or elſe that it was much more Satiated or abounded with this Ponderous *Precipitate* at one time than at another, and ſo laid it over with a thicker *Cruſt* in as ſhort a time.

If we examine the Cauſes that have been Aſſign'd to the *Production* of this *Concrete*, I think we cannot well grant *Heat* in the *Kidneys* to be a probable *Efficient* Cauſe; a much more Intenſe Heat than is poſſible to be found here, being neceſſary to make Bricks, or bake Sand and Earth into *Stone*. Nor is it neceſſary to derive the *Material* Cauſe from ſuch a Slimy and Roapy or *Mucilaginous Indiſpoſition* of the *Humours*, that may perhaps Coagulate and Harden into a *Stone*; Such a *Viſcous Urine* being leſs apt to Precipitate this Gritty matter than more Thin and Limpid *Urine*. For I have found in more than one, where the *Urine* has often been ſo Roapy and Stringy, that it would draw out into Threads upon the application of a Stick, but yet we never diſcover'd Symptoms of the *Stone* in the *Kid-*

neys

neys or *Bladder* of ſuch Perſons. Nor do I believe that an *Acid* meeting with ſome *Alkalies* may be reaſonably concluded to conſtitute this ſo firm and ſolid a *Concrete*, ſince nothing that I know of but *Acids* will make the leaſt *Solution*. We may alſo except againſt the Experiment of *Coagulation*, upon the mixtures of highly Rectify'd *Spirits* of *Urine* and *Wine*, which if warily manag'd will make a *Coagulum* with ſuch Expedition as ſeems very ſtrange and ſurprizing: for this *Concretion* will eaſily be Diſſolv'd by Water. In like manner if either of the *Spirits* be very *Phlegmatick*, there will follow no *Coagulation*; Inſomuch that the Humours of the *Humane* Body contain too much Water in them to admit ſuch an Effect, even in thoſe Conſtitutions that have uſed themſelves to very highly Rectify'd *Spirits*. Moreover *Horſes*, *Dogs*, and other *Animals*, that drink no *Wine* are not free from this Gritty *Cementation*. Nor could I ever diſcover any Drop of *Vinous Spirits* afforded upon our *Diſtillation* of this Matter. We may alſo Queſtion the *Hypotheſis* of the Production of the *Stone* by *Petrefaction*. Stones are ſuch fixt Bodies that they yield nothing upon *Diſtillation*, except a ſmall Quantity of Inſipid Water chance to Riſe; nor will they *Exhale* very much in an open Fire: Whereas we can *Volatilize* 6 parts of 8 of our *Calculous Matter*, and obtain *Salts* and *Oils*.

The *Chymiſts* deſcribe the *Concretions* of the Body, and particularly this Morbid one, by calling them *Tartareous*: who conclude they have ſufficently accounted for the Nature of a Body, if they can but call it *Tartar*, which muſt be acknowledg'd to conſiſt of *Acid*, and *Fixt Salts*, call'd *Alkalizate*, and of ſome *Terra damnata*; tho' it be very little in proportion to the other *Salts*. But there is little reaſon to Eclipſe it's Nature by that Denomination; as appears by theſe following *Analyſes*. We *Diſtill'd* an Ounce of *Calculus Humanus*, that was recently Cut out of a Body, which afforded about 2 *Dr.* of a brown *Spirit*, nearer to that of *Harts-Horn* than *Urine*. We put the *Caput Mortuum* upon the *Cuppel*, and reduc'd it to near a *Dram*; the reſt burning and ſmoaking away. Another time, we *Diſtill'd* in a Naked Fire a *Stone* that weigh'd 2 *Ounces*, the Vapour came over upon a good ſtreſs of Fire, and ſettled in the Form of *Salt* without any Liquor, of which we preſerv'd only a *Dram*, it appear'd very Brown, and taſted Bitter, as the *Fœtid Oyl* of *Harts-Horn* and other *Empyreumatical Oils* do. We examin'd by *Boiling* and *Evaporating* Water from the *Caput Mortuum*, whether it held any *Fixt Salt*, but found none. The *Caput Mortuum* weighed 1 *Ounce* and 6 *Dr.* ſo that it loſt only 2 *Dr.* in the *Diſtillation*; that is only 2 *Dr.* came over the *Helm*. We proceeded farther, and placed this *Caput Mortuum* upon a *Teſt* in an open Fire, where it burnt away to 2 *Dr.* 44 *Gr.* This we alſo *Boiled* in Water to ſee what *Salt* it held; but it ſcarce afforded a Taſte of *Salt*, ſcarce ſurmounting that we uſually find in the like Quantity of common Water. In this *Fiery Tryal*, an *Ounce* and 3 *Dr.* of the 2 *Ounces*, *Evaporated* in the open Fire (a material Circumſtance which *Chymiſts* rarely enquire after) of which we have no Account. I endeavour'd to ſave ſome of it, by placing a Taper Chimney or Tunnel to receive the Smoak, as the Fire and a pair of Bellows rais'd it, which ſo far ſucceeded that I catch'd above 2 *Dr.* of this Fuliginous Subſtance, and ſome Drops of a *Water* of a Fœtid *Saline Taſt*.

The Smoak of our common Fires gives us a *Sublimate*, whose *Chymical* Principles are no less considerable than the Bodies from whence they Ascend: For I lately found them not only to contain *Volatile Salts*, *Oils*, and *Phlegm*, with other things, but even a *Salt* so near to common *Sea-Salt* that it Shot into Cubic Figures; much like to that we have obtain'd in an *Analysis* of *Humane Urine*. But because it may be Objected that that *Salt* might probably be nothing else but the common Culinary *Salt* we constantly take in with our Food, I *Distill'd* the *Urine* of *Horses*, that were fed with Hay and Oats, and have obtain'd the same sort of *Salt*.

If we now compare this *Concrete* with *Tartar*, we find the one a *Vegetable Salt* wholly Dissolvable in Water: the other so Stubborn, that several very Corrosive *Menstruums*, that will easily Dissolve Iron, and Copper, and Silver, and almost any thing, will not make any Impression here. The one affords a little *Volatile Salt*, which is *Alcalizat*, and no *Fixt Salt*: the other gives no *Volatile Salt*, and a very large proportion of *Fixt*. The one affords much more Earthy Substance call'd *Terra damnata* than the Hoofs or Horns of Animals, *&c.* and the other leaves us scarce any. One abounds with an *Acid Salt*, which is sensible to the Palate, and very manifest in the *Spirit* of *Tartar*, but in the other we could discover none upon the narrowest Search.

The Notion of presuming this *Calculous* Matter *Tartareous*, has put Men upon using Medicines to destroy *Tartareous* Concretions, as well as avoid many things that seem to have *Tartar* in them: and yet at the same time perhaps it may be as inoffensive as some of those Medicines that are substituted; at least, as *Spirit* of *Salt* or *Common Salt*, commended by *Helmont*. In like manner the Notion of *Petrifaction* (which seems from whence the *Stone* derives its Name,) may be no less Erroneous; there being no Agreement or Analogy in their Natures, whether we consider them *Synthetically* or *Analytically*. If we consider Stones *in Composito*, there is a particular Weight or Gravity belonging to their Bulk in which they *Specifically* agree. Several sorts I have weigh'd according to the *Hydrostatical* Laws, and I find them agree in being twice as Heavy as their Bulk of Water and about a 4th part more. This I found true in *Wood*, *Bone*, and *Shells*, when *Petrify'd*, and even Water it self, and some other Bodies, tho' never so Light in their former State, as soon as they have obtain'd the form of Stone, they all become of the mention'd Weight, or very near it. But this, which is call'd the *Stone* of the *Bladder*, is much Lighter, and several of them agree in being only as Heavy as their Bulk of Water and a 4th part more. This yields to none but the most Potent *Acids*, and particularly to *Nitrous* ones alone: the other is Dissolved by almost any slight *Corrosive*. The One in our *Analysis* affords various constituent parts: and the other upon *Distillation* only a Drop or two of Insipid Water, the rest remaining Fixt.

But this *Concrete* may perhaps owe its *Origine* to a very Soft and Thin Fluid; more remotely to the *Chyle*, strain'd through the *Guts*; and yet nearer the Matter, to the *Blood* it self; but neareſt and immediately to the *Serum* of the *Blood*, which seems to be its proper *Vehicle*. And we shall be less surpriz'd to derive

such

ſuch Firm and Solid Productions from Fluids, when we conſider that there are Particles Floating in the *Blood*, always diſpoſed to be converted into *Griſtles*, or to make up the Solid *Skull*, *Nails*, *Bones*, &c. and that even the *Teeth*, whoſe Texture is very Firm, are made and ſupply'd out of the Soft Fluids of the Body. Even ſome of theſe Solid Parts of the Body may by a *Diſeaſe* of the *Blood* be Abraded, and Abſorbed by the common Fluid, and Precipitated by their own Weight upon the *Pelvis*, or elſe ſtick in the *Tubules* of the *Kidneys*, and ſo choak them up, and by degrees extend them to a Rupture, or grind them to pieces by a conſtant Impulſe of this Gritty Subſtance, which may at laſt convert the greateſt part of the *Kidneys* into this Firm *Concrete*. Moreover, without any reſpect had to theſe Solid Abraſions, the *Blood* it ſelf (of which the *Serum* is a great part, and with which it is intimately mixt) conſiſts of Heterogeneous Particles, of ſo various Forms, Sizes and Shapes, which ſeems neceſſary for their accommodating themſelves to all Parts, that even theſe deſign'd to conſtitute the Solid Parts, may ſuffer ſuch irregular Changes in the Body, which may unfit them to paſs the *Emulgent Vein*, and ſo to continue their *Circulation*: Inſomuch that the continu'd *Impulſe* of this Matter by the *Artery*, may make very conſiderable Aggregates or *Concretions* in the *Kidneys*. And not only ſo, but without either reſpect to *Vein* or *Artery*, the *Serous* or Watry part of the *Bloood*, which we ſaid before was the *Vehicle* of the *Stone*, may have imbibed ſuch Heterogeneous, Groſs and Ponderous particles, as may, whilſt in Motion and Agitation through the *Veins* and *Arteries*, fluctuate and mix well enough together, but may very eaſily ſeparate upon the leaſt *Stagnation*. Thus the various Mixtures in a *Torrent* ſeem to make up one Homogeneous Fluid, but if ſome part of this Fluid happen to fall into a Pit, or *Stagnate* in a quiet place, we ſhall find it clear it ſelf of *Sand*, *Mud*, and other Differing parts.

That the *Nature* of this *Concrete* ſeems rather referable to *Bone*, than to any other Conſiſtent or Fluid Part of the Body, I concluded by comparing their *Chymical* Products. Having clear'd the *Bone* of *Marrow* and *Fat*, by Boyling it in Water, I *Diſtill'd* it, and obtain'd about 2 *Drams* and an half from an *Ounce* of *Bone*, of a *Volatile* Liquor Impregnated with *Salt*, that Smelt very much like that I have mention'd; which was very differing from *Spirit* of *Urine*, and nearer that of *Harts-Horn*: I found the *Caput Mortuum*, as to Weight, very conſonant; and alſo could Extract no manner of *Salt* from it. For which Reaſon *Refiners* make their *Cuppels* of *Calcin'd Bones*, they being forc'd to *Dulcify* (which they call waſhing out the *Salts* of) other *Aſhes*, before they can make *Cuppels* of them. Laſt of all, it herein alſo agrees with the *Calculus Humanus*, vulgarly ſo term'd, that few *Acids* will diſſolve it, excepting thoſe that are *Nitrous*, nor do theſe work on it very Vigorouſly. But herein they muſt be allow'd to differ in their *Specifick Gravity*; the *Calculus* not having ſo cloſe and compact a Texture as the *Bones* have. For *Bones* I have found twice as Heavy as their Bulk of Water.

Several *Stones* of the *Bladder* and *Kidneys* were *Diſtill'd*, and all afforded *Volatile Urinous Salts*, which *Ferment* upon any *Acids*; *Bones* were *Diſtill'd* and

Several Comparative Experiments made upon Stones, and other things. Ib. p. 532.

and found to be of agreeable Principles; *Petrifyed Water* affords only Freſh and Clear Water upon *Diſtillation*.

Calculi examined *Hydroſtatically*, were found in proportion to their Bulk of Water as 5 to 4; *Flint*, *Chryſtall*, *Petrifyed-Water*, *Welch-Diamonds*, *Petrify'd-Wood*, almoſt as Heavy again as our *Calculous* Matter; and *Bones*, twice as Heavy as Water.

Bones were not eaſily wrought on by common *Acids*, only by *Nitrous* ones, and that without *Ebullition*. And various unſucceſful attempts were made to Diſſolve the *Calculus* by *Acid* and *Acrimonious Menſtruums*, whereof ſome were *Vegetable*, and ſome *Mineral*; as *Spirit* of *Salt*, of *Vinegar*, of *Venus*, *Oil* of *Vitriol*, &c. alſo with *Alkalizat Acria*, as *Sal Fraxini* (which Corrodes Glaſs) *Lapis Infernali*; but none would touch it except *Nitrous*.

The Generation of the Stone; *by Dr.* Tho. Molineux. *n.* 202. *p.* 818.

2. The different *Texture* of parts in one and the ſame *Stone*, Obſervable in moſt of this kind if they be of large Size, proceeds, I am apt to think, from the ſame conſtant Bed or ſettled *Poſture* of the *Stone* in the *Bladder*, whereby ſome parts of it are more expoſed to imbibe the Moiſture of the *Urine* as it falls or ſettles in the *Bladder*, than others; and by this ſort of *Maceration* are kept ſoft: whilſt thoſe parts that lie higher, towards the upper Region of the *Bladder*, remain Dry, Harden, and gather a ſort of Gritty Cruſt; as we find moſt Soft Stones do that are dug out of the moiſt Earth, when expoſed a while to the Dry Air.

It ſeems to me very probable, that *Stones* when they come to be of a large Size, keep much one and the ſame *Poſture* in the *Bladder* at all times, there not being room in ſo Pliant and Membranous a Body, that always contracts it ſelf to the leaſt Dimenſions it can, to allow a *Stone* of any conſiderable Bulk, (for the Caſe is different in thoſe that are ſmall) to Tumble, or change its *Situation* very much.

But however this Conjecture may prove true or falſe, 'tis undeniable, that ſome *Stones* from their way of Generation muſt of neceſſity remain fixt and Immoveable in the *Bladder*; being cloſely joyned and united to the very Subſtance of its Membrane: of which ſort there are ſeveral Examples recorded by *Schenkius*, and other Collectors of Obſervations. And I am perſuaded that that *Stone* which I deſcrib'd above, may be reckon'd amongſt them: For about the larger end, where 'tis marked *d d d*, there ſtill cloſely adheres ſeveral thin Films and *Carneous Filaments*, which manifeſtly ſhew it was formerly united by this part to the Membranous Subſtance of the *Bladder*, and that lately by its own Weight, or ſome other accident, it was Torn away, and fell into the *Urethra*, through which 'twas *Voided*; and hence it was that this Woman, as ſhe her ſelf told me, never ſuſpected her ſelf, till very lately, at all troubled with the *Stone*.

Vid. Supr. Sect. LXVI.

Fig. 39.

Stones Extracted from Women, without Cutting; by Dr. Tho. Molineux. *n.* 202. *p.* 817.

XCII. Amongſt the two vaſt Collections of *Stones*, that amount at leaſt to ſeveral Thouſands, kept together in the Hoſpitals at *Paris*, *L' Hotel Dieu* and *La Charité*, not one in a Hundred is taken out of a *Woman*. This muſt certainly proceed from the *Urinary Paſſage* in this Sex being ſhorter, larger, and more apt to dilate, than that in Men; ſo that for the moſt part, when Gravel

Gravel, or a ſort of Viſcous Claiy Matter, which I take to be the chief Cauſe of the *Generation* of the *Stone*, falls into the *Bladder*, 'tis ſuddenly and eaſily diſcharg'd, e're it can Cohere together, and form a *Stone* of any large Bulk: which cannot ſo frequently happen in Men, by Reaſon of the narrowneſs, crookedneſs, and length, of the Paſſage of the *Urethra*.

However, it ſometimes comes to paſs, that even in *Women*, either from a more depending or leſs elevated Poſture than uſual in their *Bladder*; or that the Matter forming the *Stone* Adheres to ſome part of its Membranes, ſo that it cannot fall into the *Urinary Paſſage*, till its own Bigneſs or Gravity forceth it thither; *Stones* of a very conſiderble Bulk are Generated. But the many Inſtances we meet with of vaſt *Stones* ſpontaneouſly *Voided*, are ſo many Arguments from whence, I think, one may reaſonably infer, That no *Woman* need to be oblig'd ever to undergo the Painful and Hazardous *Section* of the *Stone*. For ſince Nature by her own Power, without the Aſſiſtance of any Help or Remedies can disburthen her ſelf, and force away ſuch Large *Stones* as thoſe deſcribed by ſeveral Authors, we may probably conclude, That even thoſe ſtill Larger (if there be any ſuch bred in *Women*,) may be brought away by putting the Body into a convenient Poſture, and ſo by the Hand and Fingers forcing the *Stone* into the *Urinary Paſſage*, which by Application of Relaxing and ſtrongly Emollient Remedies may be ſo Dilated, as to give a free Paſſage to the *Stone* without any forceable *Section*.

Ib. p. 820.

Vid. Sup.

The Practicableneſs of this Method, hath been ſucceſsfully Demonſtrated by Mr. *Tho. Proby*, an Ingenious *Chirurgeon* of *Dublin* in three Inſtances of Fact.

Ib. p. 821.

1. The firſt Inſtance was *Sarah Cook*, a Child about 6 Years Old, who for ſome Years had been ſo miſerably afflicted with the *Stone*, and a perpetual *Incontinency* of her *Urine*, that her Parents at any Hazard were willing to attempt relieving her of ſo violent a Pain, and ſo foul a Diſtemper. Whereupon *June* 8. 1693. the Child being placed in a convenient Poſture in a Man's Lap ſitting acroſs a Table, with her Arms tied down to her Legs by a ſort of Bandage uſual in theſe Caſes, the *Chirurgeon* firſt Paſt his *Catheter* into the *Neck* of the *Bladder*, that it might empty it ſelf of all *Urine*, before he inſerted his *Dilatory* Inſtrument, or his *Speculum Veſicæ* as one may call it, with which he extended the *Urethra* as much as poſſibly he might with ſafety, and without putting the Child to extraordinary Pain; afterwards by help of a *Directory* and *Forceps* gently thruſt into the *Bladder*, he brought away the *Stones*, without any manner of *Inciſion*, in about 3 or 4 Minutes time, from the Paſſing in of his firſt Inſtrument, and put the Patient to ſo little Pain during the *Operation*, that when it was over, and ſhe laid quietly a-bed, ſhe ſlept without any *Opiate* 7 or 8 Hours together, as ſhe had not done many Months before; and was in a ſhort time perfectly well and at Eaſe.

Fig. 44.

2. The ſecond Inſtance was *Eliz. Mortimer*, about 10 Years of Age, who had been troubled with an *Involuntary* Diſtilling of her *Urine*, and other Painful Symptoms of the *Stone*, for theſe 3 or 4 Years paſt; but on *June* 12. 1693. She was happily relieved by the *Extraction* of a large *Stone*, near

Fig. 45.

near as big as a Pigeons Egg, after the ſame manner and Method as before deſcrib'd and with as good Succeſs, though not altogether with as quick Expedition.

n. 236. *p.* 11. 3. I have been ſtill more confirm'd in my Opinion of the Reaſonableneſs of this Method, by ſeveral other ſuccesful *Operations* I have ſeen of the like Kind: but more particularly, by one lately perform'd in *Dublin* on *Sarah Jones*, a Girl between 11 and 12 Years of Age, that for 6 Years had been ſeverely afflicted with all the Painful and uſual Symptoms of the *Stone*. But *Oct.* 16. 1697. ſhe was happily reliev'd, by only *Dilating* gently the *Neck* of the *Bladder*, and then *Extracting* a *Stone* of a very conſiderable Bulk, without making any *Inciſion* at all. The whole Operation was perform'd in 6 or 7 *Minutes*.

Fig. 46. By the extraordinary large *Size* of this *Stone*, it may ſeem almoſt incredible, that a Solid of that Bulk ſhould be forced through the *Urethra* of ſo ſmall and ſo young a Child, without any manner of *Section:* and that the Child ſhould recover ſo as to be perfectly well, without the leaſt ill Accident ſucceeding the *Operation*. But we may gather hence, of what vaſt Extenſion this *Urinary Paſſage*, though naturally ſtrait, is capable; and how much ſtill Wider it may be Dilated where 'tis proportionably larger, I mean of thoſe of this *Sex* of riper Years, or grown up to *Woman's* Eſtate; who may yet more eaſily and ſafely be relieved after this manner, even of *Stones* of a much larger Size than this we here ſpeak of.

The *French*, a Nation certainly very ſubject to the *Stone* in the *Bladder*, and whoſe *Chirurgeons* therefore muſt of neceſſity be very converſant with this Diſeaſe, and expert in the *Operations* requiſite for the Cure of it, have, I ſee, lately Eſtabliſhed this ſort of Practice; tho' I muſt needs own I did not know ſo much, till I had peruſed a very uſeful Book of Chirurgery, Publiſhed but this laſt Year, 1696. at *Paris* in 8*vo.* by M. *de la Vauguion*; Entituled *Traitè Complet des Operations de Chirurgie*. And I cannot but recommend it to the skilfull *Chirurgeon* as an *Operation* fit for general Uſe in theſe Caſes, being both Safe and Eaſily practicable, and alſo of great Benefit and Relief to no leſs than the Moiety of Mankind, whenever they are afflicted with this painful Diſeaſe. And to ſay truly, if *Women* in this Caſe would but timely ſeek for help, before the *Stone* be too much grown, they might with far leſs Danger and Pain be releived of this Torturing and Laſting Evil, than *n.* 202. *p.* 823. they are delivered of a common *Natural Birth*. But if at any time a *Stone* be found of ſo large a Bulk as not to admit this ſort of *Operation*, then the *Section*, if the *Chirurgion* be ſo bold as to venture on it, muſt be made ſo *Wide*, as wholly to *Cut* through the ſhort *Neck* of the *Bladder*, and to divide likewiſe ſome part of its thin *Membranous* Subſtance, which is known *n.* 236. *p.* 15. to be of the moſt dangerous Conſequence in *Cutting* the *Stone*, and to be avoided as certain Death to the Patient; according to that Aphoriſm of *Hippocrates*, *Cui Secta eſt* Veſica *Lethale eſt*. However I have Reaſon to think the Inſtances of this Kind will be very rarely met with: For Experience Juſtifies what I have obſerv'd above, that *Women* are not capable by Nature of breeding *Stones* in their *Bladders* of ſo Big a

Size

Size as Men frequently do; which is moſt apparent from thoſe many Hiſtories of Stupendious large *Stones* regiſtred by Authors, amongſt which the Largeſt I have heard of bred in a *Woman's Bladder*, was not $\frac{1}{5}$ part of what has been produc'd of this kind in a *Man's*.

XCIII. *Nov.* 8. 1693. A large *Stone* was taken from Mrs. *Henchman*, a Widow Gentlewoman, of the Age of about 51 Years. It's Shape is not very unlike to a ſort of Spring-Purſe (as they are call'd) which many People uſe; and its Surface is indifferently Smooth, excepting only that there are 4 Protuberances, each of which is about the Size of a Hazel-nut; theſe ſeem to have been at firſt leſſer *Stones*, which falling into the *Bladder* after that the great *Stone* was almoſt grown to its full Bigneſs, there were joyn'd to it, firſt by Adheſion, and at laſt became all one Body with it. It is alſo very probable, that the leſſer end of the great *Stone*, was once a diſtinct *Stone*, and fell into, or was ſeparately form'd in, the *Bladder*, a good while after that the bigger part had taken poſſeſſion there. The Length of the *Stone* is $3\frac{3}{4}$ Inches. Its Breadth, where largeſt, is very near $3\frac{1}{4}$ Inches. Its Thickneſs $1\frac{7}{8}$ Inches. Its Weight is 9 Ounces and a half *Averdupois*.

A large Stone Cut from a Woman; by Mr. Baſil Wood. n. 203. *p.* 193.

Dr. *Molineux* (that Learned Phyſician of *Dublin*) has mention'd two or three Notions which I ſuppoſe this *Operation* does confute.

Vid. Sect. LXVI *and* XCII

1. He thinks that *Women* never breed *Stones* ſo large as *Men*; the contrary of which ſeems to be manifeſt by this *Operation*: For perhaps a *Stone* of ſo large a Size as this, was never yet taken out of the *Bladder* of a Living Man.

2. He ſeems to conclude it probable that all *Women* may be freed from the *Stone* by Dilation of the *Urinary Paſſage*, and then forcing away the *Stone* through it: Which Method I think cannot be depended upon, ſince the *Stones* may prove of ſo great a Size.

3. He ſays, That dividing the Membranous Subſtance of the *Bladder*, is to be avoided as certain Death to the Patient; whereas this *Stone*, and many others, have prov'd too large to be Extracted through an Inciſion made only within the ſhort *Neck* of a *Woman's Bladder*.

The Patient never had the leaſt ill Symptom ſince her being *Cut*, and is now perfectly well.

XCIV. Brother *James*, an *Hermit* in *France*, in his *Extraction* of the *Stone* out of the *Bladder* maketh Uſe of a Steel *Staff*, much Bigger and Shorter than thoſe which are commonly made Uſe of; it is Shorter from the Top to the Bending of it, and it Bends more than ours: he hath but two, one for Men and another for Children. His *Conductor* is Slenderer and Longer than ours: the Point whereof, which goes into the *Bladder* being of the Figure of a Lozenge, is wide and open in the Extremity. His *Forceps* have Longer Branches than ours: but the Holds of them are Shorter and Wider, with many large Teeth within. The *Euretbra*, with which he draweth the Sand or Gravel, which remain ſometimes in the *Bladder* after the *Stone* is

A new Way of Cutting for the Stone, by a Hermit in France; by M. Buſſiere n. 250. *p.* 100.

out, is Shorter than ours. His *Knife* is much Longer and Slenderer than ours.

He cauſeth the Patient to lye flat upon his Back, either upon his Bed, or upon a Table whereupon is a ſoft Quilt, in ſuch a manner, that the *Fundament* is 3 or 4 Fingers over the Table, ſome Servants ſupporting his Thighs and Legs. He uſeth no Ligature, but only cauſeth his Legs to be bent againſt the Thighs, but not the Thighs againſt the Belly, except the Left, which in his *Operation* he uſeth more or leſs, as he thinks fit. Then he introduceth the *Catheter* or *Staff* into the *Bladder*; which though Bigger and Shorter than ours, yet ſeemeth to run in eaſier: very often he holdeth it himſelf with his Left Hand, preſſing it cloſe toward the *Fundament*, in order to dilate and extend the Membranes of the *Bladder*. Then he feeleth with the Fingers of his Right Hand, to find out the *Staff* through the Skin; ſo having felt it, he runneth his *Inciſion Knife* at the Bent of the Left Thigh, upon the Fat Protuberancy below the *Iſchium* Bone, directly upward, by the *Rectum* to the *Bladder*, which he Pierceth by its Neck, and ſometimes a little above it; When he *Cutteth*, the Cutting parts of his *Knife* are turned upward and downward. Having thus Pierced the *Bladder*, which he knoweth when the *Urine* runneth out, then he turneth his *Knife*, and thruſteth it a little further, in order to open the *Bladder* wide enough that his Finger may go in eaſily. Then he withdraweth his *Knife*, and enlargeth the Wound in the outward parts, of the length of 2 or 3 Inches: after which he thruſteth his Finger into the *Bladder*, in order to know more preciſely the Bigneſs and Situation of the *Stone*, and make it Looſe; but chiefly to Dilate the Overture of the *Bladder*, by tearing its Membranes. Then he introduceth his *Conductor* into the *Bladder*, along his Finger which is in it. When the *Conductor* is in the *Bladder*, he taketh the *Staff* out, and introduceth the *Forceps* by the *Conductor* into it, with which he gets hold of the *Stone*, and draweth it out. If he find any difficulty, either in getting hold of the *Stone*, or in drawing it out, he uſeth all the ways commonly uſed, raiſing the Left Thigh more or leſs, putting his Finger into the *Fundament*, and ſometimes into the *Bladder*, to looſen it in Caſe there be any Adheſion with the Membranes. Having found out and remov'd the Cauſe of the Difficulty, he thruſteth the *Forceps* again into the *Bladder*, and gets hold of the *Stone* and pulls it out.

It is to be obſerv'd, That this Second time, nor on any other, he uſeth no *Conductor*, the *Forceps* running in very eaſily. He never thruſteth either his Finger or any Inſtrument into the *Bladder*, without ſteeping them in *Oyl* of *Roſes*. He never uſeth any *Dilatorium*, or *Canula*, or Tents, in the Wound, except ſometimes ſmall Doſſils in the Lips of the outward Wound, to keep them open for a little while. He only applies a Pledget ſteep'd in *Oyl* of *Roſes* upon the Wound. He Operateth this Way as dextrouſly as any of our beſt *Operators*. Very often he *Cutteth* the Patient upon the *Gripe* almoſt in the ſame manner as was uſed formerly, except that he

maketh

maketh the *Inciſion* in the ſame Place as for the former: This Way he liketh better than the other, and it ſeemeth to be more favour'd by him; and indeed it is ſurer, tho' the Preſſing upon the *Belly*, which he doth, is a very bad Method.

He *Cutteth Women* alſo upon the *Staff*, and in the ſame Place as Men. He did perform this *Operation* in my Preſence upon Three; One whereof was but a Girl of 11 Years Old; which maketh me believe, that he uſeth the ſame Way in all, though in them he did Cut the Internal Neck of the *Uterus*.

But in my Opinion, that Way (neither in *Men* nor in *Women*) is not ſo ſure as the Ancient, by Reaſon that the Point of his *Knife* not being directed by the *Staff*, he is always in danger of Piercing all the Membranes of the *Bladder* through and through; and beſides, the place whereupon he maketh the *Inciſion* being full of conſiderable Veſſels, one can hardly avoid the Cutting ſome of them. We have obſerv'd in almoſt all that Dy'd in his Hands, that there was a great deal of *Blood* in the *Bladder*, and ſome in the Cavity of the *Abdomen*. He ſucceedeth better when the *Stone* is Big and Large, than when it is Small: by reaſon that a Big *Stone* not only extendeth the *Bladder*, but it ſtoppeth the Point of the *Knife*. He did refuſe to Cut one, in whoſe *Bladder* there was but a Small *Stone*; which confirmeth me in the Opinion, that the unſucceſsfulneſs of his *Operations* proceedeth from the Point of his *Knife* not being ſtopt, neither by the *Staff* nor *Stone*: for when there is but a Small *Stone*, the *Bladder* being Empty, he muſt neceſſarily Cut the whole *Bladder* throughly, and conſequently Cut ſome of its own Veſſels, which cauſeth the *Hemorrhage*, which is the better avoided when the *Stone* is very Large.

Obſervations and Experiments concerning this Way of Operation. Ib. p. 104.

The Obſervations I have made about this way of *Operation* are theſe. I took a Body, in the *Bladder* of which I put a *Stone*; the *Staff* being in the *Bladder*, I did preſs it downward, hard enough to be felt through the *Tegument*s, and made the Inciſion upon it in the bent of the Thigh, in order to know whether it would not be a Surer Way by Securing the Point of the *Knife*: by that Way I got my *Conductor* and *Forceps* into the *Bladder*, and drew the *Stone* very eaſily; but afterward, by the *Diſſection* of the Body, I found that the Artery of the *Penis*, and the *Veſiculæ Seminales* were Cut through and through, which cannot be avoided, becauſe the *Artery* and *Veſiculæ* lye immediately under that part of the *Bladder* which the *Staff* preſſeth upon.

I took another Body, and having put in the *Bladder* a ſmall *Stone*, I made the Inciſion much lower, and Pierced the *Bladder* under the *Staff*, by which *Inciſion* I drew the *Stone*; then *Diſſecting* the Body, I found the *Bladder* Cut through, and its *Arteries*, which can hardly be avoided, the *Bladder* being there ſo much Contracted, that both ſides of the *Bladder* are Cut before the *Operator* either feels the *Stone* or ſees any *Urine* running out.

I took a 3d Body, in the *Bladder* of which I put a very Large *Stone*;

the *Staff* being in it, I made the *Inciſion* upon the Fat Protuberancy, under the *Iſchium* Bone, and Piercing the *Bladder* below the *Staff*, I found immediately the *Stone* with the point of the *Knife*, with which I Cut the *Bladder* the length of an Inch: through which having introduced the *Conductor*, and then the *Forceps*, I got hold of the *Stone* and drew it out very eaſily. Then I did *Diſſect* the Body; and found that neither the *Veſiculæ Seminales*, nor any *Artery* had been Cut, by reaſon that the Weight of the *Stone* preſſed the bottom of the *Bladder* lower than the *Veſiculæ* and *Arteries*.

My Opinion is then, That this Way might be made Uſe of when the *Stone* is very Big, and willingly I would prefer it to the Old Way; for by this Way we avoid that extraordinary and violent *Dilatation* of the *Neck* of the *Bladder*, which the *Stone* cauſeth when it is very Big, and which is the cauſe of the Inflammation and Mortification of the *Bladder* that Killeth the Patient: But when the *Stone* is ſmall, or of but an indifferent Bigneſs, the Old way is Eaſier and Surer. But I cannot approve of this Way at all, on *Women*; ſince one cannot avoid cutting the *Neck* of the *Uterus*, the *Cicatrix* of which might prove to be of ſome ill Conſequence, in caſe the *Woman* ſhould come to be with *Child*: And therefore in *Women*, when the *Stone* is but indifferent Big, the Old Way is preferable to any other. But if it was very Big, than I had rather to thruſt my Fingers into the *Vagina*, and bring the *Stone* as near the *Neck* of the *Bladder* as can be, and Cut the Membranes of the *Vagina* and *Bladder* upon the *Stone*. I Cut a *Woman* in *Hambourgh* by that way, of which I drew a *Stone*, Weighing 5 *Ounces* and a half, who recover'd very well. By this Way we prevent the *Incontinency* of *Urine*, which followeth always the *Extraction* of great *Stones* in *Women*.

I cannot approve, neither, the *Cutting* upon the *Gripe*, as it is practiſed by ſome *Mountebanks*; Becauſe in that way one Cutteth through the *Proſtates*, which deſtroyeth the *Parts* of *Generation*. I have Obſerved that all thoſe which have been Cut by that Method, were never fit for *Generation*.

The Way of Cutting for the Stone in the Kidney; by Mr. Ch. Bernard. n. 223. p. 333.

XCV. Mr. *Hobſon*, who was *Conſul* for the *Engliſh* at *Venice*, having been long afflicted with the *Stone* in the *Kidney*, was at length attack'd with a Fit of that Duration and Violence, that it reduced him almoſt to Deſperation; and finding no Relief from any Means that had been uſed, and being under the greateſt Extremity of Pain Imaginable, he addreſſed himſelf to *Dominicus de Marchettis*, a Fam'd and Experienc'd Phyſician at *Padua*, Imploring of him, that he would be pleaſed to *Cut* the *Stone* out of his *Kidney*, being fixt in his belief that no other Method remained capable of Relieving him; Adding that he was not inſenſible of the Danger, but that Death it ſelf was infinitely more Eligible than a Life in that Miſery, under which he had long, and did then Groan. *Marchetti* ſeemed very deſirous to have declined it, repreſenting not only the extream Hazard, but as

he

he feared the Impracticablenſs of the *Operation*, that 'twas what he had never attempted, and that to proceed to it, was in effect to Deſtroy him. But Mr *Hobſon* perſiſting that if he refuſed it, he would never deſiſt till he found out one who would do it, *Marchettti* was at length by his Reſolution and Importunity prevailed upon to undertake it: and having prepared him as he thought convenient, he began with his Knife, *Cutting* gradually upon the Region of the *Kidney* Affected, ſo long till the Blood diſturbed and blinded his Work, ſo that he could not finiſh it at that Attempt. Wherefore dreſſing up the Wound till the next Day, he then repeated and accompliſhed it, by *Cutting* into the Body of the *Kidney*; and taking thence two or three ſmall *Stones*, he dreſſed it up again. From this Inſtant he was freed from the Severity of his Pain, and in a reaſonable time was able to walk about his Chamber, having been in no danger either from Flux of Blood or Fever. *Marchetti* continued to Dreſs the Wound for a conſiderable time, but was not able to cloſe it up, it ſoon becoming *Fiſtulous* from the continual flowing of the *Urine* through the *Sinus*; but being in all other reſpects reſtored to his former Health and Vigour, and the Matter diſcharged being little, he took leave of the Profeſſor and returned to *Venice*, under the Care and Management of his Wife; who one Morning as ſhe was dreſſing the Sore, fancied ſhe felt ſomething hard and rugged as ſhe wiped it; upon which, Examining a little more carefully with her Bodkin, which ſerved her inſtead of a *Probe*, ſhe found it to be a *Stone*, of the Figure and Magnitude of a *Date-Stone*; which being removed, he never after complained of the leaſt Uneaſineſs in that Part.

About 10 Years after this he returned to *London*, where the Learn'd Dr. *Tyſon* and my ſelf were by Dr. *Downes*, who had known him formerly in *Venice*, invited to ſee him. And after we had received this Account from himſelf, he gave us the Satisfaction of viewing the Sore, which continued open, and permitted me without any Complaint (the *Calloſity* being great) to paſs my *Probe* ſo far into the *Sinus*, that we concluded it reached into the *Kidney*. The Matter it then diſcharged was but little in quantity, but always Diluted with and Smelt ſtrong of *Urine*. The Orifice would ſometimes cloſe for 3 or 4 Days together, and then the Matter made its way through the common Paſſages with the *Urine*, yet without any Difficulty or Pain. There is no queſtion but that there was a Coalition of the *Kidney* and the Muſcle *Pſoas*. When we ſaw it he applied nothing to the Orifice but a clean Linnen Rag, which had a ſtrong *Urinous* Scent. He was then able, in Appearance, to perform all the Functions of Life, and to undergo any Fatigue, as any Man of his Years; being then, I conceive, upwards of 50, and was the next day to ride Poſt 40 or 50 Miles.

This, I think, is the Firſt Experiment of this Kind. Some Authors indeed have imagin'd that *Hippocrates* hath commanded the *Operation*; when Enumerating the Diſeaſes of the *Kidneys* and their Cure, he ſaith, *Quum autem intumuerit & elevatus fuerit, ſub id tempus juxta* Renem Secato *& extracto pure*, Arenam *per* Urinam *cientia, ſanato. Si enim* Sectus *fuerit, Fugæ Spes eſt,* *De Intern. Affect.*

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Antiph. Hippocr. 4. Lib. 5.

sin minus, Morbus Homini commoritur. And *Sinibaldus* in particular, upon these Words, passionately exhorts the *French* and *Roman* Chirurgions to make the Experiment upon Brutes, that they might with greater Dexterity and readiness perform it upon Men. But with Submission, he seems to infer more from these Words of *Hippocrates* than they can bear. For 'tis not sufficient (according to these Directions of *Hippocrates*) that we take our Indications from the common Symptoms of the *Stone*, be they never so Grievous and never so Evident, but there must be an *Apostem*, and that too is to manifest it self Externally by a *Tumour*. And then indeed, the Necessity and Reason of the *Operation* are so obvious, and the Difficulty so little, that no Man ought to decline it. Nor do we want Instances of *Apostems* in the *Kidneys*, occasion'd originally from the *Stone* there, and manifesting themselves by a *Tumor*, upon opening of which *Stones* have been discharg'd with the *Pus*, or have been soon after remov'd; and this is the very Case which *Hippocrates* supposes, and upon which he justly advises the Practice. But 'tis my Opinion, that we have no manner of Evidence, that *Nephrotomy* (restraining its Signification to *Cutting* into the *Kidney* for the *Stone*) was Practised in his time, or in many Ages after. For *Celsus*, although he be very particular in his Discourse of *Cutting* for the *Stone* in the *Bladder*, is silent in this Matter; and *Galen*, who is Copious enough upon Diseases of the *Kidneys*, especially the *Stone*, mentions it not. And indeed there are no Footsteps that I can discover among any of the *Greek* or *Latin* Physicians.

The First Light which I can pretend to discover of the *Operation*, as Practised in our Case, is amongst the *Arabians*. *Serapion*, who is placed by *Wolfgangus Justus* betwixt the 10th and 11th Century, tho' by *Ren. Moreau* 300 Years earlier, gives his Opinion of it thus; *Quidam Antiquorum præceperunt* Lapidem Renum *extrahi cum Ferro incidente retro super Latus duorum* Iliorum *in loco* Renum: *Ego autem video quod hæc Audacia est difficilis vehementer, & Administratio istius Curationis est maximè periculosa & suspecta de Morte.* Who these Ancients were that advis'd it, I confess to be beyond my Conjecture; unless we may be allow'd to say, That he also had misunderstood *Hippocrates*, as some have manifestly done since. Betwixt 12 and 1300 *Avicen* had much the same Opinion both of the Practice and the Practitioners; *Sunt qui laborant Extrahere ipsum per* Incisionem Ilii *& per* Dorsum: *Sed est magnus Timor in eo, & Operatio ejus qui rationem non habet.* The difference of their Sentiments being only, that one thought it the Undertaking of a Mad-man, the other of a Confident Fellow; but from *Avicen*'s Words, there is some Colour to believe that it was Practised in his Days, though undoubtedly, if it were, from his talking so slightly of it, it was only by Persons of mean Character, such perhaps as our *Mountebanks*; who having no regard or Concern for the Lives of Men, and little Reputation of their own to loose, venture boldly, and sometimes successfully, upon those things which Wary and more Judicious Men avoid. All the rest of their Writers are silent.

Tract. 4. c. 22.

P. 361. Edit. Ven. 1562.

Among

Among the Moderns, as well as I can inform my ſelf, *Fr. Roſettus* ſeems to have been the firſt, who ſeriouſly Adviſed this Practice. But notwithſtanding his Zeal to bring this *Operation* into Uſe; and tho' he urges *Hippocrates*'s Authority to Juſtify the *Cutting* into the *Kidney*, he is yet ſo Ingenuous as to acknowledge, *Preſente Tumore, nec aliter*, Hippocratem *imperaſſe* Sectionem. And as plauſible as his Reaſonings may ſeem, it does not appear, that he hath been able to gain many Proſelytes to his *Opinion*; the Senſe of thoſe Authors, who have mention'd it (who are not many neither) being generally againſt it, and concluding in Effect with *Riolanus*, *Niſi Naturâ monſtrante viam atque præeunte, nefas eſt tentare* Nephrotomiam. But although it appears to be the concurrent Opinion of thoſe Authors, who have Treated of Wounds in the *Kidneys*, that if they penetrate the *Pelvis* they terminate in *Death*, yet the Experiment above related ſhows us, that they ought not to have ſo Magiſterially exploded the *Operation*.

De Partu Cæſareo.

Encl. Anat. Lib. 2. c. 18.

XCVI. I lately took notice in the Corps of a Felon, that whereas ordinarily the *Preparing Veſſels* ariſe on the Right-ſide out of the *Cava*, as on the Left out of the *Emulgent*, his Right *Vas Preparans* ſprang clearly from the Right *Emulgent*.

An extraordinary Situation of the Vaſa Preparantia; *by Dr.* Nath. Fairfax. *n.* 29. *p.* 549.

XCVII. 1. Quid de *Teſtis* Subſtantia Obſervaverim, en tibi geminis produco *Figuris* : quarum una eſt *Teſtis Virilis*, altera *Aprugni*, ut in tumentiori mole clariora legantur omnia.

The Teſtes *Examin'd*; *by* Vadius Dathirius Bonglarus. *n.* 42. *p.* 843.

A A, Uterque *Teſtis*, per medium ſciſſus. *B B*, Tunica *Albuginea*. *C*, *Vaſorum Præparantium* in *Albuginea* Inſertio. *D D*, Ductus *Highmorianus*, per medios *Teſtes* exporrectus; exactè in *Aprugno*, non item in *Virili*. An Linea fibroſa *Riolani* inſeparabilis a *Teſtis* Tunica? *E E E E*, *Vaſa Præparantia*, *Albugineam* perforantia, & Ductui Semi-circulari nexu commiſſa. *F F F F*, Genuina *Teſtis Virilis* Subſtantia, nullatenus Glanduloſa ſed omnino Vaſata: Ita ut totus ſit totum Vas *Teſtis*; In *Aprugno* Vaſa interjacet Teſticularia * * * * leve ſtratum propriæ Carnis *f f f f*. *G G*, Exiles Fiſtulæ, modo plures, modo pauciores, è Ductu ubi ſtatim ex *Albuginea* emerſit in Capite *Teſtis* exortæ. *H H*, Principium *Epididymidis* non Glanduloſum, ex *Highmor.* ſed ſolis contextum Vaſis, ex *Riol.* valida ſibi Membranula invicem adſutis. Hinc videre eſt, *Epididymida* ex Fiſtulis ſubortam, Fiſtulas ex Ductu. Atque adeo *Semen* inchoativè generatur in *Teſte* intra Vaſa Teſticularia, è quibus mox ſtillat in Ductum, è Ductu dein per Fiſtulas convehitur ad *Epididymida*, in cujus perplexitate tandem perficitur. *I I*, Reliqua *Epididymidis* Series plane Vaſculoſa, & ita in *Teſte* & *Epididymide Virilibus* nil quicquam eſt Glanduloſæ Suſtantiæ. *K K*, Vas *Ejaculatorium*, recta *Epididymidis* continuatio.

Fig. 47, 48.

2. This Paper was Printed at *Florence* 1658. Since which the Subject hath been conſider'd by *D. de Graef*, and lately Examin'd by the *R. Society* with ſo much Care and Exactneſs, that now there remains but little doubt of what is, and has been ſo many Years ago conceiv'd, by Able Anatomiſts here in *England*, of the Structure of the *Teſticles*, *viz.* That they are a *Con-*

By ..... *p.* 844.

geries

geries, or heap of very Fine *Veſſels*, that may be Drawn out like a Thread, and diſtinctly expos'd to the Eye.

The Texture of the Teſtes; *by Dr.* Tim. Clarck. *n.* 35. *p.* 681.

XCVIII. 1. Quod aſſerit Doctiſs. *Van Horne*, (cum D. *de Graef*) *Teſtis* Subſtantiam non eſſe niſi *Conglomerationem* aliquam quorundam quaſi Funiculorum, vel potius Vaſorum minutiſſimorum, non ſolum hoc jamdudum conſtabat Nobis, ſed jam ante etiam Celeberrimo *Riolano* & aliis. Hoc addam, ope *Microſcopii* Funiculos iſtos videri ubicunque per minutiſſimas Glandulas tranſire; unde Similitudinem Pultaceæ cujuſdam Subſtantiæ refert *Teſtis*. Tametſi vero in aliqualem Longitudinem Funiculi hi protrahi poſſint, totam tamen ejus Subſtantiam quaſi Lanam factam è Fuſo explicari poſſe, nunquam adhuc potui experiri.

By Sir Edm. King. *n.* 52. *p.* 1043.

2. In *Nov.* 1668. I Diſſected the *Teſticulos Cuniculorum Marium* in ſeveral Shapes, and I find the Veſſels in them to lye in Round Folds, in the manner of the little *Inteſtines*, but both Ends of each Roll meeting at their Inſertion, which ſeems to be made into the *Ductus Nervoſus*: And every one of theſe little Rolls are very curiouſly Embroider'd with other Veſſels, which I judge to be Veins and Arteries by reaſon of their Reddiſh Colour; appearing in them even to the bare Eye. Theſe little Rolls lye in Ranges, having a kind of Uniformity not unpleaſant to behold by a good Light. When I Cut one of theſe Rolls Tranſverſe, there ſeem'd to me 5, 6, or more diſtinct Tubes in one Roll, contain'd as 'twere in one common *Membranula*; but the fine Texture and Tenderneſs of them is ſuch, that they will not admit of Expanſion in ſuch a manner, as ſome other *Teſtes* will, and eſpecially as that of a *Rat* is ſaid to do by Dr. *de Graef*, if we miſtake him not.

Vid. Sup. c. I. *Sect.* XI.

It was aſſerted by me ſeveral Years ago, concerning the *Parenchyma* that it is a Congeries of *Veſſels* and *Liquors* without any intermediate Subſtance: And I have ſince that time made ſeveral Experiments of the ſame kind, about the *Teſtes*, the *Pancreas*, and other (ſo eſteem'd) *Glands*; and as far as I have Examin'd them, I find them to be only a Texture of Fine Tubes or *Ducts*, with more or leſs Liquor, without any other Subſtance.

I have alſo Diſſected the *Teſticulos Tauri*, and order'd them ſeveral ways; ſome Boil'd, others Broil'd, others Infus'd in *Spirit* of *Wine*, Hot and Cold, *&c.* and upon the beſt Examination, I can make, I cannot ſee any of this intermediate Subſtance, or indeed any thing elſe, that is not *Veſſel* or *Liquor*.

I ſhall here add another Experiment, and that is *Teſticuli Humani*, hoping to put it out of Diſpute that it is nothing elſe but a *Congeries* of *Veſſels* of various ſorts, and their ſeveral *Liquors*; and that there is no ſuch thing as an intermediate Subſtance (by what Name ſoever it be call'd). To Demonſtrate this, I expanded on a Glaſs the true and Genuine Subſtance *Teſticuli Humani*, I mean, the Body of it after the *Tunica Albuginea* is removed, without any Addition or Diminution, excepting only what *Liquors* Dry'd up during the time of the Expanſion, (which could not be prevented in making ſuch a Scheme of it;) and it then appear'd to the naked Eye as in the *Figure*.

Fig. 49.

If

If it ſhould be Objected, that this may be Drawn out into Seeming *Veſſels*, which yet may not be really ſuch; I Anſwer, that theſe *Veſſels* have the ſame appearance in the Body of the *Teſtis*, as to denote them ſuch, before they are Drawn out; and in the Extenſion it does ſometimes ſo happen, that one of them will Extend eaſily near half a Yard long before it Breaks, though ſo exceeding Delicate and Tender, as you may Imagine: And when it is thus Extended, it hath a kind of reſemblance to the Corrugations of the *Epididymis*, and keeps the ſame Figure and Magnitude in the whole Extent of them, as to the Sight; unleſs they begin to Dry, and then you may ſee them looſe their *Girations* upon Streiching: as you may ſee of both ſorts repreſented in the *Figure*, as they appeared on the Glaſs above-mentioned.

And that the greateſt part of theſe *Veſſels* are Arteries, or other Veſſels that immediately receive Liquors from them, I may prove, I think, from another Experiment, made by Injection into a part of the *Arteria Præparans*, before I went to Expand the Body of the *Teſtis*; whereupon opening the Part, which I ſaw diſcoloured, I found that many of theſe Tubes had received ſome of the fine Particles of that Matter, which I Tinged my Injected *Spirit* with.

And to prevent another Objection, that might ariſe, *Viz.* That theſe Particles might poſſibly change their Colour only Outwardly; I uſed other endeavours to aſſure my ſelf, that the ſaid Particles were indeed Included within the Cavities of theſe Tubes. In the doing of which, I did Moiſten thoſe 2 Tubes with *Spirit* of *Wine*, to ſee whether that would Remove or Alter thoſe Particles: But finding no ſuch thing, I Prickt and Open'd with a fine Needle part of the Containing Tube; whereupon I ſaw iſſue forth ſeveral of thoſe Liquid Particles afore-mentioned: Which aſſures me farther that this is a mere Scheme or Congeries of Veſſels.

3. Quod Cl. D. *Clarck* ait, ſe *Parenchyma* (quod Succum quendam denotare dicit Affuſum vel Effuſum & aliquo modo Concretum in Vaſculorum & Fibrillarum Interſtitiis,) in *Teſticulis Virorum*, & aliorum etiam Animalium, Teſtimonio Senſuum oſtendere poſſe; hoc Ego, pace tanti Viri dixero, non niſi *Autopſiâ* edoctus admittere poſſum. Quandoquidem ſæpiſſimè *Hominum* aliorumve Animalium *Teſticulos*, exceptis Tenuiſſimis quibuſdam Membranulis, ita diſſolverim, ut ne Umbra quidem talis *Parenchymatis* remaneret; imò, quod magis eſt, quorundam Animalium *Teſticulos* ita diſſolvi, ut viſus acie ne quidem Membranulæ illæ conſpicerentur. Et ut Verba mea factis comprobem, mitto ad te *Gliris Teſticulum* meo modo diſſolutum, ut videas, an *Glandulæ* tales in *Teſtibus* (quales proponit Clar. Dn. *Clark*) vel etiam *Parenchyma* tale reperiatur. In hunc fere modum reliquorum Animalium *Teſticulos* diſſolvere poſſum, ea tamen Diverſitate, ut in nonnullorum *Teſtibus* aliquæ Membranulæ tenuiſſimæ, & in quorundam, Radix præterea *Epididymidis Highmori* remaneat.

By Dr. de Graeff ib. p. 1046.

Fig. 5.

4. What theſe two laſt induſtrious Phyſicians have imparted, looks very fair to evince, that the *Teſtes* of Animals are made up of nothing but *Veſſels* and their *Liquors*. But notwithſtanding this, Dr. *Clark* and divers other

By ..... p. 1047.

Ingenious and expert *Anatomists* and Physitians, still doubt, whether that be so indeed, considering that not only it cannot be deny'd, that this curious heap of *Strings*, or suppos'd *Vessels*, was at first cover'd all over with a Mucous Matter (which in so fine and tender a Part may well be thought to serve for a *Parenchyma*,) but also that M. *de Graeff* must himself grant, that in the said Part there are found certain small Membranes besides those *Vessels* he is Asserting; such another Substance being conceiv'd to be highly necessary to serve for a *Medium*, whereby that compounded *Liquor*, which from the greater *Vessels* passeth into the minute Arteries, Nerves, and *Lymphe-ducts* of the *Testes*, may be Secreted, and according to the different Nature and Figure of their several particles convey'd into those several small and Subtile *Vessels*,

By S. Malphighi. n. 71 p. 2150.

5. Interior *Testium*, præcipue *Equinorum*, Tunica, *Carneas* Fibras seu extensum Musculum in sui Meditullio una cum Varicosis Vasis continet, quæ diversas Inclinationes, ut in *Liene*, habentes, per transversum productæ & reticulariter implicitæ, *Intestinulorum* Congeriem firmant & comprimunt.

The Vasa deferentia; by Dr. Timothy Clarck. n. 35. p. 681.

XCIX. Hic tibi mitto Figuram *Vasorum Deferentium* & *Vesicularum Seminalium*, sicut illa ab Exercitatissimo *Lowero* & a meipso è Corpore Humano exsecta fuêre. Gratulor Doct. *Regnero de Graaf*, vel potius mihimet, quod eandem Veritatem, ni fallor, Invenimus & Asserimus: *Communio* enim illa *Vasorum Deferentium* cum *Vesiculis Seminalibus* ita manifeste se prodit, ut illi, qui per *Siphonem* liquores aliquos in *Vas Deferens* injici curaverit, ne guttula Liquoris injecti per foramen in *Urethram* exire videatur, priusquam Extremum superius *Vesicularum Seminalium* attigerit.

Fig. 51.

In Angulo enim *A*, ita Communio ista constituitur, ut *Vesiculæ Seminales* prius totæ impleantur, quam Liquor ullus in *Urethram* possit exire. Agnosco etiam, per duo foramina *Semen* in *Urethram* injici; sed vix Doctissimo Viro possum concedere, unam solummodo esse materiam *Seminis*: Si enim *Testis*, Mechanicâ Structurâ, Colore, & Substantia, ab *Epididymide* differat, sicut *Epididymis* à *Parastata*; si etiam in his Succi diversi, & Substantia & Colore, inveniantur, diversæ procul dubio *Seminis* materiæ in illis conficiuntur.

Explication of the Figure.

Fig. 51. Exhibetur pars *Vasis Deferentis*, cum *Vesicis Seminalibus* unius Lateris; sicut in Corpore, antequam exsecta illa fuere, apparebant. *A*, Angulus *Communionis*. *B*, Extremum superius *Vesicularum Seminalium*. *C*, *Vas Deferens*, ubi Syphonem parvum inseruimus. *D*, Foramen apertum in *Urethram*. *a a a*, Pars *Vasis Deferentis*. *b b b*, *Vesiculæ Seminales*. *c c c*, Ductus à *Vesiculis* in *Urethram*.

Two new Glands, near the Prostate Glands, with their Excretory Ducts, lately discover'd; by Mr. Will. Cowper. n. 258. p. 364.

C. About a quarter of an Inch below the *Prostate Glands* *E*, I found two other small *Glands* *G G*, placed on each side the *Urethra* *F*, a little above the Bulb of its Cavernous Body *I*: These *Glands* are of a depress Oval Figure, not exceeding the Magnitude of a small French Bean. After those parts of the *Musculus Accelerator l l*, are remov'd, which pass over these *Glands*, you may feel them placed like two hard Bodies on each side the *Urethra*. They incline to a Yellowish Colour, like that of the *Prostates*.

Fig. 52.

Their *Excretory Ducts* appear on their internal Surface *A b*, next the inner Membrane of the *Urethra C*, whence they descend about half an Inch in length before they grow less, and pierce that Membrane obliquely at their opening into the *Urethra*, *D*, in which they discharge their Separated Liquor. After opening the upper part of the *Urethra* towards the *Dorsum Penis*, and expanding its inner Membrane, if you Compress these *Glands*, you may see their Liquor issue from two distinct Orifices, which is very Transparent and Tenacious: These 2 Orifices open into the *Urethra*, just below its bending under the *Ossa Pubis* in the *Perinæum*. Fig. 33.

The Artifice of Nature is very extraordinary in thus placing these *Glands*, and their *Excretory Ducts*, since on the *Erection* of the *Penis*, and the Distention of the Bulb of the Cavernous Body of the *Urethra*, they are thereby necessarily Compress't, and the Liquor contain'd in their *Excretory Ducts* forc'd through their two Orifices into the Cavity of the *Urethra*: Besides this, that part of the *Musculus Accelerator* (mention'd above) which passes over these *Glands*, contributes to this Compression. It seems requisite such Agents should conspire in Compressing these Organs, since the Liquor they separate is so very Tenacious: which Consistence of it is absolutely necessary for the Uses it is employ'd in.

The main Design of Nature in framing these *Glands*, seems to respect the grand Work of *Generation*, which will be more evident if we examine the *Analogous Organs* in other Animals. In *Rats* these *Glands* are remarkably large, and are so plac'd, that upon the *Erection* of the *Penis* they are Compress't by its Turgency and Apposition of the *Ossa Pubis*; the like may be observ'd in other Animals, particularly in *Hedge-Hogs*.

Boars have these *Glands* very Large, and the Matter they separate is more Tenacious, and not so Transparent as in all other Creatures I have examin'd; there is something peculiar in the Contrivance of them in this Animal, each *Gland* being cover'd with a peculiar Muscle not unlike the *Gizards* of some Fowl; which Mechanism seems contriv'd for more forcibly Compressing of them, to discharge their very Tenacious Contents into the *Urethra*, and that not only in the time of *Coition*, but at any other time; which seems to be more peculiarly requir'd in those Creatures, because the *Passage* of their *Urine* is very long, and therefore stands in need of more of this *Glutinous* Matter to besmear it, whereby it is defended from the Injuries that may arise from the *Salts* of the *Urine*. As the *Urine* of different Animals is more or less impregnated with Pungent *Salts*, so the Proportion of these *Glands* differ, as well as on the account of the various Lengths of their *Urethra's*. It is remarkable we don't find these *Glands* in *Females* like those in *Males*, tho' they have something Analogous to them, which are describ'd in *Women* by *De Graaf*, and call'd *Prostatæ Mulierum*; but the Orifices of their *Excretory Ducts* opening at the Exit of the *Urethra*, they serve to defend the *Nymphæ* and *Labia Pudendi* only from the *Urinous Salts*, and discharge their Liquor in *Coitu*, as I have elsewhere taken notice; the whole *Urethra* in them being so short, that the Contraction of the *Sphincter* Muscle of the *Bladder* is sufficient to expell any remains of *Urine* from that Passage.

The Use of these *Glands* is twofold; *First*, on the *Erection* of the *Penis* there is so much of their Liquor discharg'd into the *Urethra*, as suffices to drive out any remains of *Urine*, and prevent its mixing with the *Semen*; and at other times, the continual discharge of some part of their Liquor into the *Urethra*, defends that Passage from the *Salts* in the *Urine*: the like continual Exudation cannot happen either from the *Excretory Ducts* of the *Prostates*, or those of the *Vesiculæ Seminales*, because the nearness of the *Sphincter* Muscle so corrugates the inner Membrane of the *Urethra*, as prevents an easie Passage of the Liquor by the *Ostiolæ* of the former: nor can the *Semen* run out of the latter, since the *Caruncula*, or *Caput Gallinaginis*, is contriv'd on purpose to prevent it: wherefore the *Diaphragme*, *Abdominal* Muscles, and *Levatores Ani*, are employ'd in Compressing those Parts to Discharge their Contents.

It is not improbable that the Matter, which flows at the latter end of the Cure of *Venereal* Diseases, and is call'd a *Gleet*, proceeds from these *Glands*, and not from the *Prostatæ* or *Vesiculæ Seminales*, as is commonly suppos'd; which may afford us no mean Argument for the Use of *Injections* in such Cases; instead of which some Practitioners persecute their Patients with violent Purges, and Cram them with vast Quantities of Astringent Medicines. We may easily conceive such *Gleets* become sometimes very Obstinate, if not Incurable, by supposing the *Ulcer* in that Contact to happen upon the *Ostiolæ* of these *Secretory Ducts*.

Explication of the Figures

Fig. 52. *A*, A Portion of the *Bladder* of *Urine*. *B B*, Parts of the *Ureters*. *C C*, Parts of the *Vasa Deferentia*. *D D*, The *Vesiculæ Seminales* somewhat Distended with Wind, by blowing into the *Vasa Deferentia*. *a a*, The Blood Vessels of the *Vesiculæ Seminales*. *E*, The *Glandulæ Prostatæ*. *F*, The *Urethra* Expanded, after opening its superior and fore-part, to see the *Ostiolæ* of the *Excretory Ducts* of the following *Glands*. *G G*, The 2 *Glands* above describ'd, which from the Liquor they separate may be call'd *Glandulæ Mucosæ*. *b*, The *Excretory Duct* of the last mention'd *Glands*, before it passes under the Bulb of the Cavernous Body of the *Urethra*. *I*, The Bulb of the Cavernous Body of the *Urethra*, partly Distended with Wind, and Divested of the *Accelerator* Muscle, to shew its External Membrane which is very Thin, whereby the last nam'd Muscle does more adequately Compress that Bulb, and drive its contain'd Blood towards the *Glans* when the *Penis* is erected. *K*, The 3d Pair of the Muscles of the *Penis*. *L L*, The *Accelerator* Muscle divided in its Middle Seam on the Bulb, and afterwards freed from it, and Expanded. *l l*, The upper part of this Muscle, which passes immediately over the *Mucous Glands*. *M M*, The *Musculi Directores Penis*. *N N*, The Cavernous Bodies of the *Penis*. *O*, The Cavernous Body of the *Urethra*. *P*, The Ligature made to prevent the Wind from passing out of the Cavernous Body of the *Urethra* and its Bulb. *Q*, The Aperture by which the Inflation was made.

Fig. 53. One of the *Mucous Glands* after being Macerated in Water, and its *Excretory Duct* fill'd with Quick-silver. *A*, The *Mucous Gland* somewhat

what Diſtended. *b*, Its *Excretory Duct*. *C*, A Portion of the Internal Membrane of the *Urethra* Expanded. *D*, The *Oſtiola* of the laſt mention'd *Excretory Duct*.

CI. In hoc obſcuriſſimo omnium Viſcere extra *Graviditatis* Tempus, ob contracta Vaſa & in Varices contorta, ita implicitæ ſunt componen es Particulæ, ut nulla fere arte diſtingui poſſint: In Turgente autem & Prægnante *Utero* (*Brutorum* præcipue) quædam Emergere videntur. *Vaccinum* itaque *Uterum* ſum aggreſſus, cujus Copia facilius occurrit, & ex Magnitudine minus obſcura ſunt ipſius componentia. Hujus Exterior Membrana denſa valde ſeſe offert, quæ Univerſum *Uterum*, *Tubas*, *Vaginam*, & Appendices, inveſtit & firmat. Sub hac Carneæ Fibræ locantur, quæ per longum ductæ, & quaſi in Carneos Lacertos interdum addenſatæ, diverſas inclinationes ſortiuntur. Interſeruntur autem ad invicem, præcipue verſus *Tubas*, & non longè ab *Ovariis* in Faſciculos conglobantur. Aliæ quoque Horizontaliter ſecundum Craſſitiem *Uteri* propagantur, hærentque Pelliculis tenuibus ſub diverſis Planis totum *Uterum* ambientibus. Non longe ab his occurrunt *Lymphatica Vaſa* proprio turgentia Humore, qui admoto Igne tandem perſpirat. Sub prædictis Vaſis *Venæ* & *Arteriæ* excurrunt hinc inde *Uterum* ingreſſæ, ita ut Rete elegans efforment, cujus Areæ diverſam exhibent *Figuram*. Solent tamen, ut non raro obſervavi, Gemini *Venarum* Rami unicam concomitari *Arteriam*. *Nervi* quoque interſeruntnr, totam *Uteri* molem pervadentes.

The Structure of the Uterus; *by* S. Marc. Malpighius. *n.* 161. *p.* 630.

Alia quoque *Vaſa*, ſeu Ductus, quæ *Uteri* propria ſunt, inſignia & perampla *Graviditatis* præcipue tempore deprehendi. Horum itaque varia eſt productio, cum ab *Uteri* Subſtantia partim emergant, partim quoque Interius lateant. Hæc Gemina ſunt, unum enim hinc inde *Uteri* & *Vaginæ* quaſi Latera excurrit, ea præcipue in parte qua *Uterus Veſicam* reſpicit & contingit. Et licet ab extrema *Vaginæ* uſque ad gracileſcentia *Uteri Cornua* propagentur, non eandem tamen ubique redolent Speciem, nec conſimili magnitudine donantur, aut ſub eodem Plano feruntur. Inferior namque Portio, non longe ab *Urethræ* Orificio terminata, immediatè ſub Membrana interiora *Vaginæ* cuſtodiente ſurſum recta fertur verſus *Uteri* Os. Hæc Portio frequenter vix Stylum admittit, interdum Auricularis Digiti Latitudinem æquat, unde lato Capitulo, evidentique Hiatu, fere ſemper ſupra *Urethræ* ſeu *Urinarii Meatus* Orificium, in *Vaginam* aperitur. Non longe a Plicis Os *Uteri* excitantibus, obliterari videntur hujuſmodi *Ductus*, ſolique (prout v ſus ſum attingere) minimi occurtunt Poruli & Meatus in continuatum Vas deſinentes. Hæc itaque Obſcurior horum Vaſorum portio ab evidenti *Ductu* exorta, intra Carneas Fibras condita, ſurſum per anguſtati *Uteri* Latera propagatur, donec exterius à *Cervice* erumpens ſupra *Uterum* producta emergat. Varias ſortitur Species hæc Vaſorum Portio, & accuratam exigit Indaginem, ut evidenter patula reddatur; ſæpe enim interius condita, ita gracileſcunt hæc Vaſa, ut quaſi inconſpicua reddantur: non raro Globuli inſignes & frequentes attolluntur, precariam Coronam æmulantes, & interdum turgente intus Humore rectus *Vaſorum* progreſſus occurrit.

occurrit. Emergens vero horum *Ductuum* portio ab *Uteri Cervice* ſupra Carneas Fibras, & ſub ſanguineis Vaſculis lateraliter producitur per Corpus & *Cornua Uteri*, quorum interiorem Circumvolutionem productis hinc inde Ramis irrigat, donec Obſcuris finibus in gracileſcentibus Tubis oblitteretur. *Vaſa* hæc, licet Tubuloſa ſint & continuato ferantur tramite, ab ambiente tamen Involucro, ſeu Ligamento, & ab interiori ipſorum Structura, varie deturbantur, ita ut multiplices Formas acquirant; ea namque pars, quæ *Uteri Vaginam* excurrit, Sinuoſa eſt, & recta ſurſum producitur. Ambiens interius Membrana Aſpera eſt, nam rotunda lateraliter habet Orificia; hæcque admiſſum Stylum non longius progredi ſinunt, & interdum quaſi Glanduloſi Folliculi ſubrotundi appenduntur intro hiantes. Plures quoque per Tranſverſum extenduntur Membranæ *Valvularum* inſtar, unde in aliquibus Appendices quaſi cæcales excitantur, quales in Inteſtino *Colon* obſervantur. Prope *Urethræ* Orificium latiora redduntur hujuſmodi Vaſa, & non raro Sinuoſo quodam Capitulo turgent, à quo tortuoſos Ductus intra *Vaginæ* concavitatem aperitur, ita ut Gemina Obſcuraque Orificia *Urethræ* hiatui proxima pateant. Superior Vaſorum pars, latera *Uterini Oris* excurrens, Involucro quaſi Cartilagineo cuſtoditur; unde Varicoſa redditur, & Appendices ſubrotundas hinc inde promere videtur, ubi præcipue ambiens *Vagina* in diſperſos Globulos extuberat; in quibus vero contento intus *Ichore* turget, rectus efficitur Tubulus; ablato enim Cartilagineo Involucro tenella Vaſorum Membrana manifeſtatur. Emergens tandem à *Cervice* portio, Calami Scriptorii magnitudinem & formam ſortita, firmo involucro, etiam per aliquod ſpatium ambitur; deinde Spirali quaſi Ligamento circumdata, elegantiſſimi Vaſis Speciem adepta, ſenſim decreſcit, & Subrotundas interdum promit lateraliter Appendices Succo refertas, & ulterius elongantur, donec prope *Cornuum* curvatorum in Ramulos lacinietur, quibus Gracileſcentis *Uteri* portio irrigatur. Et quoniam admiſſum Siphone Atramentum Vaſorum extremos fines non ſubit, ob contenti fortaſſe Humoris Viſciditatem, ideo ultimus Surculorum terminus non attingitur. Interdum loco Propaginum Appendices ſeu Loculos obſervavi Succo turgidos. Vaſa hæc in *Prægnantibus* una cum *Utero* ita elongantur & diſtenduntur, ut in *Vaccis* ultra Longitudinem Brachii extenſa viderim, multoque tunc temporis *Ichore* turgentia, unde de facili obvia fiunt. Totam exaratorum Vaſorum concavitatem Subpallearis Succus occupat, qui variam tamen in diverſis partibus & individuis Subſtantiam ſortitur; nam in Sinuoſa parte, quæ per *Vaginam* excurrit, frequenter Mucoſus eſt; & Pultis inſtar Semiconcretus, non raro obſervatur; in reliqua vero productione *Terebinthinam* Colore & Lentore æmulatur; Ignique expoſitus copioſas excitat Bullas, & tandem Glutinoſum *Charabis* inſtar relinquit Craſſamentum.

Ut autem ſingula hæc pateant, tibique obvia reddantur, exarata Vaſa, avulsâ *Urinariâ Veſica* & ambiente Membrana, Sanguinea Vaſcula & Fibrarum Implicationes detrahes, ita ut exterior *Uteri* anguſtata portio, ſub qua *Os* latitat, *Cervix* & *Cornua* denudata pateant, illico enim Tubuloſa hæc Vaſa hinc inde ultra *Uterini Oris* ſitum, in *Cervice* ſcilicet Emergent, ipſorumque ulteriorem progreſſum ſupra *Cornuum* latera attinges. Inferior vero horum

Vaſorum

Vaſorum portio tibi patebit invento eorundem hiatu in extrema *Vagina* non longe ab *Urethræ* Orificio. Interdum contentus in his Ductibus *Ichor* tranſparet ita, ut ſi interior *Vaginæ* Superficies luſtretur, latæ videantur Lineæ per longum ductæ. Facto itaque Foramine Stylus immittatur, qui ſenſim penetrando totam quaſi *Vaginam* excurret. Ut autem Obſcurior & intermedia horum Vaſorum portio & continuatio pateat, Erumpentis Vaſis ex *Uteri Cervice* Involucrum deſcendendo ſenſim ſecabis; contenti namque Ductus Sub-lutea Membrana Semitam indicabit. Et licet Vaſa hæc Gracilia & Varicoſa exiſtant, Sectis tamen per longum Carneis Fibris *Uteri* & Varicoſis Globulis, poſtremò tibi occurrent. Interdum ubi turget *Ichor*, Vaſa hæc Ampla & Recta facillimè obvia fiunt.

Superatis Vaſorum, Fibrarumque Carnearum implicationibus & Tunicis, ſecto ſecundum Craſſitiem *Utero*, in *Gravidis* præcipue, ſpatium quoddam ſeu Interſtitium interdum ſemi-digiti per Tranſverſum occurrit, quod à Reticulari Contextura occupatur, qua Subvitellina quædam Corpora, Vaſorum ſpeciem habentia prout videre licuit, ad Interiorem *Uteri* Superficiem producta firmantur; circa hæc ludunt Sanguineæ minimæque Propagines, ita ut quaſi *Omentum* excitetur. *Uterus* interius Membrana quadam ambitur, quæ minima & innumera habet Orificia, Glutinoſum Mucoſumque fundentia Humorem, quo *Uterus* ipſe & *Vagina* perpetuo madent: Quare compreſſo *Utero* proſilit hujuſmodi Mucoſus *Ichor*. Patent autem hæc *Excretoriorum Vaſorum* Ora, ſi diu interior *Uteri* Membrana aqua maceretur, & in *Ovibus* præcipue obvia ſunt; quare probabile eſt Subvitellina exarata Corpora his Orificiis in *Uteri* cavitatem hiare; an vero his minimæ appendantur *Glandulæ*, licet Senſus diſtincte non attingat, ratio tamen ex perpetua Naturæ operandi Norma probabiliter eas ſuadet. Obſervantur quoque quamplurimi in tota *Uteri* & *Cornuum* interiori Superficie Tumores inæqualis magnitudinis parum aſſurgentes, qui *Graviditatis* tempore inſigniter turgent, & *Uteri* Appendices videntur, ſeu Vaginularum congeries, unde *Cotyledonum* nomine inſigniuntur. Admittunt autem erumpentes à *Chorio* ſubintrantes Radices, ita ut ex his duabus inſitis partibus completa habeatur *Glandula*, qua ſeparatum ab *Utero* Alimentum *Fœtui* ſubminiſtratur. Taliter igitur compactum corpus, geminaque integratum parte *Placentulæ* ſeu Subrotundi parumque depreſſi corporis ſpeciem habet, varioque inficitur Colore; ea namque portio, quæ ab *Utero* attollitur, Cinerea eſt, altera autem Subrubeſcit. Dimidiata *Uteri* Glandula Congeries eſt Vaginularum & Sinuum, quibus alte perfoditur, unde Atramento affuſo manifeſtantur. Hujus Subſtantia parum differt à Velamento Bombycino, quo *Inteſtina* & Ruminantium *Ventriculi* interius obducuntur; Subrotundas namque Appendiculas promit, & compreſſa copioſum Succum Ptiſanæ perſimilem reddit. Sanguineis Vaſculis irrigatur, unde injecto per *Uteri* Arteriam Atramento tota denigratur. Interdum viſus ſum, obſcure tamen, Subflavum quoddam attingere Vaſculum, cujus ulteriorem indaginem tuæ Sedulitati relinquo. Altera *Glandulæ* pars *Chorio* adnata laciniatis quaſi Radicibus coagmentatur, quibus exaratas Vaginulas ſubintrat. Tibi autem pulchrum occurret Spectaculum, ſi evaginata hujuſmodi pars intra aquam diu contenta *Microſcopio* luſtretur: Separatæ

enim

enim Radiculæ & Capillamenta ſenſim ita attolluntur, ut elegantem Sylvam æmulentur; innumeræ namque quaſi Plantarum Radices à communi Trunco propagantur, quæ in multiplices ſubdividuntur Surculos, & in Capillamenta laciniantur. Harum ſubſtantia non differt ab *Uteri* Vaginulis, & Sanguineorum Vaſorum Propagines recipit, ita ut quælibet minima Radicula ſuis gaudeat Sangineis Surculis, qui per medium perpetuo ducuntur.

Uteri Compages in *Mulieribus* adeo obſcura eſt, ut pene impoſſibilem ſui indicet Reſolutionem; contracto namque *Utero* ita complicantur & Varicoſa redduntur Vaſa, ut nullus ſit locus *Sectioni* etiam Accuratæ. Ea tamen tibi indicabo, quæ ex repetitis *Sectionibus Mulierum*, vel à Partu, vel circa Septimum *Gravidationis* Menſem defunctarum, obſervare potui. In his igitur *Uterus* craſſitie Digiti latitudinem æquat, & Sanguinea Vaſa copioſa recipit, quæ ramis Rete efformant. Exterius Fibræ Carneæ in Faſciculos coagmentatæ, & Reticulariter implicitæ, *Uteri* Structuram componunt, ita ut ipſius interior etiam moles ſit Lacertorum congeries & complexus, qui variam ſortiuntur Inclinationem. Inter exaratas Carneas Fibras copioſæ extenduntur Pelliculæ, ſeu molles Tunicæ, ſupra quas ampli Sinus fere innumeri Vaſorum inſtar per longum excurrunt, qui in diverſis Planis ſuperlocati, frequentibus Orificiis ditantur quamcunque Peripheriam ſpectantibus; unde inter proximos Sinus fit mutua *Anaſtomoſis*. Horum ſpeciem in *Mammarum* Tubulis, & in *Pene* habemus; in his nonnihil Sanguinis reperitur, ita ut videantur *Venarum* Diverticula, vel ſaltem ipſarum Appendices: non longe ab his excurrunt Sanguinei Surculi, non diſpari ritu ac in *Liene* accidit. Interior *Uteri* Subſtantia avulſo *Chorio* & *Placenta*, Muſculoſa occurrit vario Lacertorum complexu excitata, & à rimulis Sanguinea Vaſa in Surculos diviſa promit. Huic *Uteri* Superficiei *Graviditatis* tempore Pelliculæ quædam adnaſcuntur, quæ *Chorio* præcipue & *Placentæ* connectuntur; hæ Molles ſunt & Mucoſæ, facileque lacerantur. Ab his Rete quoddam fulciri & produci videtur, quod Cinereis quibuſdam, & Friabilibus componitur corporibus, quæ Tereti forma pollent, & propagatis lateraliter Ramis in Retis formam implicantur, *Piſciumque Omentum* ræpreſentant. Circa hæc Corpora Sanguineæ ludunt Propagines varicosè ductæ & verſus *Chorion* & *Placentam* elongatæ. An exarata corpora, Reticulariter implicita, ſint Fibræ Carneæ, an Nervi, an ſatius Excretoria *Uteri* Vaſa, tuipſe Judicabis. Occurrit *Placenta Uterina* una cum *Chorio* firmiter *Utero* annexa. *Placentæ* compoſitionem integre attingere non licuit, ob Friabilitatem & Mucoſitatem, variamque partium Implicationem. Illud tamen videtur certum, *Placentam* eſſe Vaſorum *Umbilicalium* contexturam peculiari firmatam Subſtantiâ. Et ſicuti *Cotyledones* propria donantur Subſtantia, quæ ſanguinea Vaſa fulcit, & eiſdem loco Cribri vel Coli, inſervit; ita *Placenta*, quæ eſt aggregatum ex *Cotyledonibus*, *ſcil.* ex partibus *Uteri* Vaginulas ſubeuntibus, neceſſario congeries eſt Radicum & Surculorum Vaſorum *Umbilicalium*, qui ſupra laciniatam Glanduloſam Subſtantiam producuntur. Interdum viſus ſum Sanguineis propaginibus rotundos Globulos, ſeu *Glandulas*, quales in *Renibus* obſervamus, appenſas attingere; immerſa tamen in aqua *Placenta*, non occurrere hujuſmodi *Glandulæ*, ſed laciniata tantum corpora Sanguineis Vaſculis irrigata obſervavi,

obſervavi, quæ Plantarum Radiculas æmulantur. *Uterinæ Placentæ* Superficies, qua *Utero* nectitur, inæqualis eſt, nam videtur appendicibus ſubingredi *Uteri* Sinus & Concavitates quaſi *Cotyledonum* ritu.

Uterorum forma in ſingulis fere *Animalium* Speciebus varia eſt, & ab *Anatomicis* tam graphice deſcribitur, ut noſtram non exigat Expoſitionem. Illud tamen perpetuum videtur, Tubis ditari, quæ in *Plantarum* Uteris præ reliquis luxuriant. Non longe ab ipſis *Ovaria* locantur, quæ antiquitus *Teſtes* cenſebantur. In *Vaccis*, in quibus ampla & manifeſta extant, obducta Membrana Fibris Carneis firmata ambiuntur. Qua ratione *Ovum* ab *Ovario* emergat, & in *Tubas* tranſducatur, ſolicita multaque eget indagine. Quæ tamen ex fortuitis *Ovarii* in *Vaccis* luſtrationibus colligere potui, tibi brevibus aperiam; non enim licuit, ut in *Incubatis Ovis*, ſucceſſivam Obſervationum Seriem ex mactatis ſtato tempore quamplurimis *Quadrupedibus* attingere, cum Regias fere Impenſas exigat, quod *Harveo* & paucis conceſſum ſcimus. Illud itaque certum videtur in Tenellis & Adultis *Quadrupedibus*, & precipue *Vaccis*, *Ovaria* complures continére inæqualis magnitudinis Veſiculas Colliquamento turgidas, quod Igne in Albuminis *Ovi* naturam concreſcit. Non ſemel vidi ab *Ovario* pendentem Veſicam, quæ magnitudine *Gallinaceum Ovum* ſuperabat, & Albumine concreſcibili referta erat. Veſiculæ hæ Tunica ſatis denſa muniuntur, cujus interiorem Superficiem (ut non ſemel obſervavi) Sanguinea Vaſa minis plexibus irrigant. Tractu temporis Luteum, ſolidumque corpus emergit, in tantam excreſcens molem, ut totam quaſi *Ovarii* partem Papilla quadam protuberat; magnitudine, completo augmento, Ceraſi Fructum æquat. Exterior Superficies aſpera eſt, nonnullis exiguis Tumoribus inæqualibus excitata, Fibris Carneis ambitur, quæ ut in *Glandulis* obſervatur, interius ſeſe inſinuant. Vaſa quoque Sanguinea & *Nervi* excurrunt. Membrana involvitur, præcipue in Papillari appendice, quam communis *Ovarii* Tunica ulterius inveſtit. Componitur exaratum corpus Fruſtulis & quaſi Lobulis, ut in aliis Viſceribus admirati ſumus: hi autem Anguloſi ſunt, & variam ſortiuntur Inclinationem: videntur enim appendi Sanguineis Vaſculis, & producto quaſi *Umbilico*. Lobulorum compages obſcura eſt, & Varicoſis propaginibus Lutei Coloris conflatur, quibus videntur Subrotunda corpora & appendices Aurei Coloris, & quaſi Adipis minima Fruſtula necti & continuari. Interior Configuratio exarati Lutei corporis non eadem omnino quocunque tempore reperitur, ſed varia occurrit. Interdum enim, ut à ſimpliciori exordiar, Conglobatum, implicitumque obſervatur corpus Varicoſis productionibus Lutei quandoque Subcinerei Coloris contextum, quod vix Granum Milii, vel ſaltem Viciæ, excedit. Frequentius tum circa Veſiculas, Colliquamento ſeu Albumine *Ovi* turgidas, adhucque minimas, exterius Involucrum Lutea Subſtantia compactum & quaſi capreolis excitatum obducitur. Non raro Luteum hoc corpus magnitudinem Ciceris pene adeptum, Pyrum figura æmulatur, & interius à Centro verſus Collum ſenſim anguſtatum Sinum habet Colliquamento turgidum. Sæpe acquiſita magnitudine Fructus Ceraſorum, exteriori Papilla ab *Ovario* erumpens Veſicam Colliquamento refertam, Mulei inſtar Ceraſorum, in Centro continet, quæ interdum Rotunda eſt, & non

raro pluribus Styliformibus appendicibus donatur, frequentius tamen una tantum gaudet appendice. In completo quoque Luteo hoc corpore interdum nil fere occurrit contenti Colliquamenti, ſed frequentiſſime ab interiori Tunica Papillam inveſtiente, ubi Fovea exterius ut plurimum excitatur, & Foramen poſtremo excavatur, Cinereum quoddam corpus producitur Membraneum, & fortaſſe Fiſtuloſum, quod verſus Centrum perpendiculariter elongatum in Ramos Vaſorum inſtar dividitur, qui univerſam Lutei corporis compagem excurrunt, hiſque appenduntur Lobuli ſub diverſis inclinationibus. In aliquibus Adultis Luteis corporibus verſus Centrum, & quandoque profundius, *Ovulum* cum appendice magnitudinis grani Milii obſervatur exarato Cinereo corpore contentum. Sæpe Meatus quidam ſeu Ductus aperitur, à profundo uſque ad Papillæ Centrum productus, in quo Diaphanus ſtagnat Humor, qui Igne in Albumen concreſcit, & non raro *Ovulum*, vel gemina cuſtodiuntur appendice donata, non valde diſſimilia quoad formam ab his, quæ in Muſcis Gallarum obſervantur. Poſtremo tandem Lutea hæc corpora effœta deprehenduntur, ſinuoſo Ductu pervia, qui à Papillæ medio foras hiat, ita ut Stylum admittat: incluſa vero Cavitas magnitudini Piſi æquatur, & ambiente Membrana una cum continuato Ductu inveſtitur. Hæc itaque in diverſis Conſtitutionibus deprehenſa, probabiliter evincere videntur, Luteum hoc corpus non ſolum pro Cuſtodia *Ovuli*, ejuſque Ejectione, à Natura excitatum eſſe, ſed fortaſſe ejuſdem Generationi conferre, hincque Glanduloſum potius, quam Muſculoſum cenſendum eſſe; ejus enim Structura non eſt Fibroſa, nec Carnea, ſed potius ſuccenturiatis *Renibus* perſimilis; unde probabiliter dubitari poteſt per Glanduloſum hoc Luteum Filtrum præparari & ſeparari Materiam, quæ tranſmiſſa per Ramos *Umbilicalis* Vaſculi, tandem in *Ovulum*, ſeu prævíam Cicatricem *Ichore* contentam, immutatur. Hujus Analogam productionem in *Plantarum Ovis* intuemur, in quibus *Umbilicale* Vas primo emergit, cujus extremitas ſenſim laxatur & turget ex ſubingreſſo Colliquamento, quod tandem Plantulam manifeſtat. Ex his quoque dubitari poteſt, Veſiculas, quæ quocunque tempore in *Ovariis* copioſæ luxuriant, in æqualem ſortitas magnitudinem & concreſcibili Colliquamento plenas, non eſſe vere *Ova*, quæ poſtremo fœcundentur, ſed Materiam ex qua fortaſſe Glanduloſum, Luteumque corpus primo excitatur. Non enim videtur certum, poſt *Coitum* tantum, Seminiſque Maſculini Affuſionem, Luteam & Glanduloſam manifeſtari Subſtantiam, & hanc fœcundati incluſi *Ovuli* Signa præferre; nam frequentiſſime in *Vitulis* nuper natis unam vel alteram Veſiculam inſignem deprehendi, cui Lutea hæc Subſtantia Graminis inſtar adnaſcebatur, In *Vaccis* quoque Prægnationis præcipue tempore, & in diverſa contenti Fœtus ætate, Lutea hæc corpora interdum Ciceris, modo Ceraſorum fructum æquantia in *Ovariis* obſervavi, & hæc multiplicia, nec tamen Superfœtationis Suſpicio aderat. Hoc idem in *Muliere* circa Septimum Graviditatis Menſem obſervavi, quin & in uno eodemque *Ovario* in diverſis Animalibus plura Lutea hæc corpora inæqualis magnitudinis extant, in quibus non ſuccedit tanta Fœtuum Multiplicitas. His addam in pluribus *Ovariis*, concoctis precipuè, Vaſa ampla Luteo Succo concreto turgere. Dubitari quoque poteſt non unicam Veſiculam Albuminis abſumi pro generati-

one,

one Lutei unius corporis, ſed forraſſe plures inſummi; nam ubi perfectum extuberat Luteum hoc corpus, non ſolum totam ferè *Ovarii* Concavitatem occupat, ſed frequenter paucæ Albuminis Veſiculæ adſtant, cum alias copioſiſſimæ numerentur. His itaque penſitatis non improbabiliter colliges, Luteam hanc, Glanduloſamque Subſtantiam non immediate ſubſequi *Seminis* Affuſionem factam in *Ovo* intra *Ovarium* contento; ſed longe ipſum antecedere, & ſubventanea quoque dari *Ova*: Veſiculas pariter Coliquamento refertas non eſſe rigoroſe *Ova*, ſed Materiam, ex qua Glandula excitatur, cujus ope *Ovum* ſeparatur, fovetur & ſtato tempore ejicitur. Erumpit autem *Ovulum*, foraſque truditur, dum extuberans Glanduloſi corporis Papilla ex Carnearum Fibrarum contractione extra magis exprimitur, & lacerata ſenſim tenui ambiente Membrana hiante *Umbilicali* Vaſe, vel Sinu, conditum *Ovulum* foras exprimitur; Interdum etenim Papillam *Præputii* inſtar à Carneis Fibris *Ovarium* ambientibus revulſam vidi, unde patebat Hiatus in concavitatem Glanduloſi corporis: *Ovulum* autem, ut in *Gallinis* accidit, contractis Carneis Lacertis, quibus reticulare Opus Infundibuli, ſeu extremæ Tubæ conflatur, abunde & ſecure excipitur, ut in Tuba fœcundetur. Extruſo itaque *Ovulo* ſenſim flacceſcendo contabeſcit Glanduloſum corpus; & de facili obliteratur, ſicut anguſtatis Arteriis & Venis Glandulæ & Viſcera quoque fere abolentur.

Expoſitam hanc *Uteri* Compagem meditanti mihi quædam probabilia proferre liceat. *Uterus* ex Natura ſua Vegetationis Ager eſt, in quo ſata Semina, ſeu *Ova*, foventur, & Viventis partes explicatiores reddi æ manifeſtantur & firmantur; & licet à parente Fæmina *Ovum* decidat & ſeratur, ineffi-cax tamen & fatuum eſt, ideoque *Maſculini Seminis* Energiam exigit, à quo Vegetationis Principium inchoetur: quare ex Naturæ Legibus *Mulieres*, ſicut & reliqui Viventium Ordines *Ova* promunt, quæ *Uterino* Sinu recepta, & *Maſculino Semine* fœcundata in novum Animal explicantur. Qua ratione autem in Viviparis præcipue contingat *Ovi* Fæcundatio non eandem apud omnes invenies Sententiam; plerique enim cenſent, *Seminis* corpulentiam *Ovo* ipſi, *Ovario* adhuc appenſo peculiaris cujuſdam Ductus ope affundi: alii vero jam delapſo, intraque *Uteri* Clauſtra concluſo aſpergi autumant; & poſtremo nonnullorum eſt firma Opinio, immutato totius *Uteri* Tono, infectoque Sanguine à *Virilis Seminis* Aura tandem concluſum *Ovum* Fœcundum reddi. Conſtat autem, Tibique diverſos Animalium *Uteros* ſecanti ſæpius patebit, Anfractus & Obſtacula occurrere, quibus *Seminis* corpulentiæ ingreſſus in *Uteri* concavitatem intercipitur. In *Vaccis* Ichor quidam & lentus exillat Mucus; ſeu Gelatina, qua non ſolum interior *Uterus* madet, ſed ejuſdem Os obturatur, & ſuperior *Vaginæ* Portio refertur; quare ſicut *Seminis* corpulentiæ ingreſſum prohibere poteſt, ita ejuſdem Auræ, & Spirituoſis Habitibus Menſtruum & Vehiculum opportune ſubminiſtrare probabiliter poteſt. Extillans igitur *Ichor* ab exaratis ſuperius Oſculis, quibus *Uteri* & Tubarum interior concameratio pertunditur, non ſolum totum *Uterum* & *Vaginam* irrigat, ſed effuſo intra *Vaginam Semini* occurrit, ejuſque volatiles Particulas coercendo ſibi intime miſcet, à quibus tandem fermentatur & turget. Hæc motio media partium contiguitate continenti *Utero* communicatur, ejuſque fluidis particulis impertitur, ita ut in *Utero* & contentis Humoribus novus Tonus, Copu-

lationes & Motus ſuccedant. Receptum igitur ab *Ovario* media Tuba *Ovulum* ſufficienter irrorari poteſt, & Energetico illo *Maſculini Seminis* Spiritu fœcundari, à quo Motus Principium manifeſtari incipit. Hinc *Hippocrates* fortaſſe Siccos, vel plus juſto Humidos *Uteros* Steriles dicebat; in illis enim Genituræ Vis non coercetur, nec propagatur; in his vel diſſipatur, vel effluit, ita ut in Temperatis tantum Conceptus ſubſequatur. Quid ſimile miramur in *Papilionibus*, in quibus ingens Bicornis Veſicula extremo appenditur *Ovario*, à qua glutinoſus perpetuo extillat *Ichor* in concavitatem *Vaginæ*, quo *Maſculinum Semen*, aliuſque etiam à laterali Loculo eructatus humor excipiuntur & foventur, quibus omnibus pertranſeuntia *Ova* irrorantur & fœcundanur, & ita per plures dies Plaſtica illa Vis conſervatur, & ſubſequentibus diebus excurrentibus *Ovis* communicatur; quod pariter in *Gallinis* conjectari licet, in quibus *Seminis* ſemel recepti Energia non parum conſervatur, ita, ut ſucceſſivo etiam tempore *Ova* fœcundentur. Et quoniam Natura in *Gallinaceis* non ſolum Cicatrici, in qua partium Rudimenta latent, Galli *Semen*, vel aliud Menſtruum ab eodem Fœcundatum aſpergit, & affundit, ſed totum *Ovum*, Alimentum ſcilicet ſub Specie Albuminis & Vitelli vi Plaſtica irrorat, ita ut totum Fœcundetur; ideo cum *Uterus* Humoribus turgidus *Ovulum* ambiens Analogus ſit Gallinorum *Ovo*, ipſum quoque una cum contentis Humoribus fœcundari probabile eſt; hoc autem interius extillans ab *Utero* Ichor *Semine* turgidus præſtare poteſt. An vero *Uterina Vaſa* ſuperius expoſita huic Fœcunditati aliquid conferant, dubitari poteſt. Et primo probabile eſt, contentum Succum *Fœminei Seminis*, vel ſaltem *Proſtatarum* Ichoris loco eſſe, & inde Incitamentum & propriam Energiam una cum *Maſculino Semine Ovo* communicare poſſe. Quoniam tamen hæc Vaſa per longum *Uteri* producuntur, & extremis finibus ejuſdem *Cornua* irrigant, Glutinoſo pariter Succo turgent *Graviditatis* præcipue tempore, ideo mihi dubitandum occurrit, *Maſculini Seminis* volatilibus Particulis non parum immutari contentum in hujuſmodi Vaſis Humorem, indeque exteriores & præcipue *Cornuum* partes Fœcundari, in quibus fit primæva Conceptio, & ſucceſſiva Fœtus Auctio & Nutritio. Nec tibi improbabile hoc videbitur, ſi Mente revolves, hujuſmodi Humorem *Maſculino Semine* de facili alterari, cum paſſim ex unico, ſoloque Concubitu cum *Lue Venerea* infectis totus ita inquinetur Humor, ut Acidior redditus perpetuam ſibi viam affectet, & ſemel inſpiratum Miaſma diu conſervet. Delapſum itaque ab *Ovario Ovulum*, & Menſtruo *Uterino* utriuſque *Seminis* Volatilibus Particulis turgido aſpergitur. *Uterus* quoque interius & exterius, contentique in eo Humores ita turgent, ut Sanguis novo recepto motu intra Vaſa non parum ſubſiſtat, *Cotyledones* extuberent, & fluvidis redditis, & ad motum promis omnibus incluſi in *Ovulo* Fœtus Nutritio & Auctio celebrentur.

Varia eſt Natura in Mechanico illo Apparatu, quo à Vaſis *Uteri* in Fœtum Succus tranſducitur; nam *Placenta*, vel quid Analogum frequentur intercedit. Exarata *Cotyledonum* Structura ſuperius expoſita præ reliquis elucebit; eſt enim ſui Generis Glandula *Conglobata*, in qua Portio *Uteri* propria carne donata receptum ab *Uterinis Arteriis* Succum percolat, qui ſeparatus in Sinuoſis Cavitatibus recolligitur, donec ſenſim fiſtuloſas alterius Glandulæ partis Radiculas ſubeat, & *Venarum* Surculis excipiatur. CII.

CII. 1. *Jan.* 6. 1669. M *Benoit Vaſſal*, Chirurgeon at *Paris*, opening the Body of a Woman of 32 Years of Age, of a Sanguine Conſtitution, and a Maſculine Port, found two *Matrixes*. They were ſo well diſpos'd by an extraordinary Contrivance of Nature, that the True one had conceiv'd eleven ſeveral times, *viz.* 7 Males, and 4 Females, all Born at the full time, and all perfectly well form'd: But they were at laſt follow'd by a Brother, yet a *Fœtus*, that was conceiv'd in an adjunct *Uterus*, in a place ſo little capable of Diſtention, that ſeeking enlargement, after it had caus'd to the Mother for two Months and a half grievous Symptoms, did at laſt, being of the Age of about 3 or 4 Months, break Priſon, and found its Grave in that of its Mother, by a very great Effuſion of Blood in the whole Capacity of her *Abdomen*; which caſt the Mother into ſuch violent Convulſive Motions for 3 Days together, that ſhe dy'd of them.

Fig. 54.

Explication of the Figure.

A, Pars *Vaginæ*. *B*, *Orificium Internum Matricis* apertæ. *C*, *Collum Matricis*. *D*, Cavitas *Matricis*. *E*, Linea ſeparans cavitatem *Matricis*. *F*, *Uteri Fundus*. *G*, Duo Sinus, inventi in *Fundo Uteri*. *H H*, Craſſities *Uteri*. *I I*, *Ligamentum Latum*; ſive Productio Peritoneæi lateris Siniſtri, continens in Plicatura ſua Vaſa *Deferentia* & *Ejaculantia*. *K*, *Arteria Spermatica*. *L*, *Vena Spermatica*. *M*, *Teſticulus*. *N*, Verum *Vas Ejaculatorium* inſertum *Fundo Uteri* per Sinum ibi inventum. *O*, Alterum *Vas Faculans*, quod ingreditur *Collum Uteri*, quò ejaculantur Mulieres a Conceptu. *P*, *Tuba Uteri*. *R*, *Ligamentum Rotundum*. *S*, *Ligamentum Latum* ab ea parte, ubi ſpurius hic *Uterus* formatus eſt. *U*, *Vena Spermatica*. *T*, *Arteria Spermatica*. *V*, *Teſticulus*. *Z*, Pars *Tubæ*. 2, Verum *Vas Ejaculatorium* quod *Fundum Uteri* ingreditur per Sinum ſupra dictum. 3. Alterum *Faculatorium*, abiens in *Uteri Collum* 4, Pars lacerata à Fœtu aucto. 5, Fœtus eo Situ, quo inventus fuit *Amnio* ſuo obvolutus. 6, *Vaſa Umbilicalia*. 7, *Placenta*, Subſtantiæ cuidam Carnoſæ adhærens. 8. Subſtantia Carnoſa. 9, *Ligamentum Rotundum*.

2. It may be, that that which is by M. *Vaſſal* eſteem'd a *Second Womb*, is nothing elſe but the True *Matrix* lengthen'd, or that which by Anatomiſts is call'd *Tuba Fallopii*.

By ..... *ib.*

CIII. A Woman, Aged 44 and upwards, ſome time after ſhe was Marry'd, had *Conceiv'd* (as ſhe thought) by ſome ſuppos'd Symptoms of *Pregnancy*, and in order to her Delivery, at the Expiration of the time of her Account, her Midwife was conſulted. Her (fancy'd) Pains came on, and ſhe thought her ſelf very near her Labour. Her *Belly* was grown very Big, and had gradually increas'd from the time of her (imagin'd) *Conception*; but alas, ſhe found her ſelf deceiv'd in her Expectation, and her Preparations for this time all in Vain. Her Illneſs wore off, without leaving any Prognoſtick of an approaching Birth. Thus ſhe continu'd, growing bigger and more indiſpos'd, and took much Phyſick but without any Relief, thoſe whom ſhe conſulted not knowing what her Diſtemper was. At laſt,

A Woman Hydropical *in the External Tunick of the* Uterus; *by Mr.* Turner. p. 207. p. 20.

laſt, after more than 3 Years from the time ſhe thought her ſelf *Pregnant*, ſhe remov'd into the Air, where ſhe had not continu'd long, before ſhe Languiſh'd and Dy'd.

The Corps being laid as advantagiouſly as might be, we began our *Inciſion* from the *Umbilicus* tranſverſe the *Abdomen* to the *Ilia*: And from the ſame Center another *Inciſion* direct to the *Os Pubis*. Here was now an Expectation on all hands of ſomething Rare and Monſtrous, when on a ſudden one of the Diſſecters (little thinking what was ſo near) in Cutting through the *Peritonæum*, accidentally thruſt his Knife too far, and immediately there aroſe a Spring, as it were, of a *Limpid Serum* or *Lympha*, as clear as Water from a Fountain, riſing up a very conſiderable height, and with great Impetuoſity. Having emptied the Containing Part of its Water, which in Quantity did ſomewhat exceed 2 Gallons, we found its Encloſure was a thin tranſparent Membrane. And when I had turn'd this Membrane to the Right-ſide, I perceiv'd underneath this outward *Tunick*, or (as I thought) adhering to it, a more Carnous Subſtance. We then Divided the *Os Pubis*, and paſſed in a Probe through the *Pudenda* into the *Vagina Uteri*, and having traced it as far as it went, by looking into the *Pelvis*, and ſearching for that Carnous Subſtance I have already ſpoken of, we found it to be nothing leſs than the *Uterus* it ſelf; when Cutting into its Body we perceiv'd the end of the Probe already entered in the *Cervix* or Neck thereof. So that (what ſeem'd to us ſtrange) we were at length aſcertain'd of the Truth, and convinc'd, that the aforeſaid Water was contain'd in the External Tunick of the *Womb*, whoſe great Weight had thruſt the Body thereof perfectly on one ſide, and hinder'd an admiſſion of ſearch from the *Vagina*, towards the *Fundus Uteri*, the *Cervix* thereof being kept cloſe as in a True Conception.

One of the great Indications of this Woman's *Pregnancy*, was a Flux of a Whitiſh or Pallid Humour to her *Breaſts*, which ſhe could ſqueeze out at pleaſure, and thought it to be no other than *Milk* generated therein, in order to the Nutrition and Conſervation of a future Birth. She had likewiſe labour'd, the greateſt part of the Time, under a Suppreſſion of the *Menſes*, whoſe Reflux to the *Breaſts*, when an Alteration had been induc'd by its Glandules, might as I conjecture (iſſuing from the *Papillæ* under a Subalbid Form) be taken for *Milk*, and give grounds of the Suſpicion that ſhe had *Conceiv'd*.

A Woman Hydropical *in her Left* Teſticle; *by Dr.* Hen. Sampſon. *V.* 140. *p.* 1000.

CIV. This Woman was about 50 Years Old; had been Marry'd, but had never born Child; had been a Widow for about 10 Years before her Death, in which time ſhe was much oppreſs'd with Grief, and her *Belly*, by Degrees, began to Swell: yet not much, till about 4 Years before ſhe Dy'd. In the Year 1677, at which time ſhe Weigh'd 216 ℔. I adviſ'd her to Uſe of *Cathartick Hydragoges*, and *Diureticks*, after the Uſe of which for ſome time, ſhe Weigh'd but 200 ℔. But ſtill the Morbifick Matter was re-accumulated to the Diſeaſed Part. So that reſolving to forbear further Medicines; within half a Year after ſhe Weigh'd 250 ℔. Her *Belly* being

being, at last, so far Distended, as to hang down, as she sat, a good way below her Knees.

Being call'd to open her, I put a Pipe into the Cavity of the *Abdomen*: but hereupon there issu'd only some few Drops of *Serum* like the White of an Egg. At another place there ran about 20 ℔. of a Browniſh Water or *Serum*; one of the Vesicles, hereafter mention'd, being pierced. Having separated the Muscles of the *Abdomen*, I found no *Serum* or *Hydropick* Water therein; but a heap of Bladders, of several Sizes, presented themselves. From the Greatest whereof, being pierced, there issu'd about 20 ℔. more of a Brown and Thickish *Serum*, Tinctured with a Sediment of the Colour of Amber. Some of the Lesser were about the Bigness of a Child's Head; which yielded a Slimy *Serum*, in Consistence and Colour, like the Mucilage of Quince-Seeds. Others were much less, some as big as a Man's Fist, some as an ordinary Apple, and some as a Walnut. In most of which was contain'd a *Serum* like to the White of an Egg; In some of them, much less Viscous and somewhat White, like Stearch newly boyl'd. At the length I perceiv'd, that all these Bladders were Parts someway relating to the *Womb*. Wherefore having separated the *Ossa Pubis*, I took out the *Womb*, with the *Pudendum*, and Parts appendent all together. And then amongst other particulars, observ'd, That the Right *Testicle* or *Ovary*, was but Small, White, and its Vesicles in a manner dry'd up. But the Left to be swell'd into a vast Bulk: The aforesaid Bladders, in one of which were contain'd so many Pounds of Liquor, being nothing else originally, but the *Eggs* belonging to this Left *Ovary*. Imagine you saw about 40 Bladders, some of a little Pig, others of a Hog or a Calf, and some of an Ox: all Distended with Liquor, and ty'd, like a Reeve of Onions all together, and you have also seen this *Ovary*. The *Testicle* or *Ovary* it self, all the *Serum* being exhausted, weighed (together with the *Womb*, which was but light) 25 ℔. Out of all the said Vesicles or Bladders together, were exhausted above 112 ℔. of *Serum*.

CV. Mrs. *Brown*, Aged about 29, of a Sanguine Complexion, had been Marry'd about 4 Years, in which time she had had one Child: Her *Belly* Swell'd, and she thought she was with Child; she had often great Hysterick Fits, something like those of an *Epilepsy*, lying in her Fit sometimes without Sense or Motion, at other times with great Screaming and Idle Talk. These, with proper Remedies, were remov'd at several times with difficulty. Coming to be about 6 Months gone with Child (as she thought) she began to have some doubt whether it were so or not, because she had her *Catamenia* very regularly. I was of Opinion she was not with Child, and would have treated her with Steel, and Purgers of Water, as *Hydropically* dispos'd Bodies require; but she fancying she felt the Child stir, put a stop to that Course, and went on expecting the good Hour, having prepared all things for the Child (to be Born) and her self during her Lying in. She delayed the propos'd Method for 3 or 4 Months beyond 9, thinking she had counted wrong; but at last she was perswaded to Medicines, and underwent a very strict Course, as for *Hydropick* People; her Legs did not Swell nor Pit, her Belly

A Dropsy in one of the Ovaries of a Woman; by Dr. Hans. Sloan. n. 252. p. 150.

was

was unequal, and the Swelling more of the Right Side, ſo that the Navel was thruſt over to the Left Side. She had alſo Reſolving Plaiſters apply'd to her Belly, but all in Vain. excepting that with much Anxiety, Gripes, and Trouble, ſo much Water might be Evacuated, as to bring down her Belly, 3 or 4 Inches. At laſt after ſhe had Conſulted other Phyſicians and ſome Quacks, ſhe hearken'd to a *Paracenteſis*, which was propos'd by ſome, and after a ſuitable Prognoſtick, was reſolved on and perform'd at ſeveral times, by diſcharging great Quantities, of firſt a Limpid Thick *Serum*, as Whites of Eggs, Inſipid and Coagulable into the like Subſtance by Heat; it came afterwards to the Colour and Conſiſtence of thin Honey, and Coagulated on Evaporation. In ſome time ſhe fell into a Fever, with a great Thruſh, Hickups, and in about 9 Days Dy'd.

Out of her Body, when Diſſected, was diſcharg'd ſome Buckets of the ſame Watery Subſtance that had been diſcharg'd by the *Paracenteſis*; part of this was floating in the *Abdomen*, but far the greater voided out of great and thick Bags, ſome of which were as large as the Stomach, others ſmaller, many of them Rotted to pieces, and all of them in the Right *Ovary* or *Teſticle*: The *Uterus*, *Tuba Fallopiana*, and every thing elſe being Sound, bating the *Omentum* which was quite conſum'd. What was very ſtrange was, that ſeveral Bags of the larger Size in this *Ovary*, contain'd others ſmaller within them; and thoſe who were larger, were fill'd with a Mellaginous Liquor; thoſe ſmaller with one like Whites of Eggs. Here and there between, were *Apoſtems*, which were but ſmall and fill'd with Yellow Matter. The *Gall-Bladder* was full of ſeveral Triangular Yellow *Stones*. She was very Lean all over her Body, and never had her Legs Swell or Pit; nor the Noiſe of Water on her ſtirring in Bed, till ſome ſmall time before the *Paracenteſis*; when ſhe fell into ſo great an *Orthopnæa*, that ſhe could not, unleſs Erect, Breath.

An Embryo of 4 Weeks; by Drs Phil. Ja. Hartman. n. 258. p. 66.

CVI. Matrona 40 circiter Annorum, tertium hunc *Abortum* faciebat 27 *Sept.* 1685. Ante 4 *Septimanas* ipſi *Menſes* adhuc fluxerant, tertio autem qui *Abortum* præceſſit Die, Linteis Lævigandis operam navans, & Cylindris ducendis manum admovet; exin die dicto Sanguis Grumoſus magnâ copiâ erumpit, quum aliàs *Uteri Hæmorrhagiæ* eſſet obnoxia, ſucceſſit tandem *Placenta* cum *Chorio*, *Amnio*, & *Fœtu*, formâ Ovi integri; quod *Ovum*, citra ullam aliorum contractationem ac palpationem, Domum auferre licuit, ubi Otioſus omnia rimatus ſum.

Explication of the Figures.

Fig. 55. *Placentæ* ſtructuræ exterioris, quâ *Utero* adhæſit, partem *Cotyledoniformem* exhibens. *a a a a*, Magnitudo *Placentæ*, quæ totius *Uteri* Cavitatem implevit. *b b b b*, Pars *Cotyledoniformis* meris Glandulis Globoſis obſita; Glandulæ in medio Rubicunda puncta oſtendunt Vaſorum Ruptorum ora hiantia: circa puncta ſunt Foveolæ quaſi impreſſæ, quas & *Sceleton* monſtrat: Huic parti *Cotyledoniformi* intus oppoſitæ erant Veſiculæ, Rubicundo & Flavo Liquore diſtentæ, quas *Fig.* 57. exprimit. *c c c*, Loca in quibus Sanguinei Ductus inſigniter erant conſpicui.

Fig. 55.

Fig.

Fig. 56. *Placentæ* Structuræ exterioris, quâ *Utero* adhæsit, partem alteram exhibens. *A*, Locus ex quo Vasa longiora avulsa dependebant; ubi *Placenta Utero* firmius annexa aut agglutinata fuit. *B B*, Laciniæ *Placentæ* gracilescentis. *C*, Foramen per quod *Chorion* & *Amnion* prominebant. *D D D D*, *Placentæ* Globus quem omnes *Figuræ* repræsentant ut totius *Uteri* Cavitatem à *Placenta* succinctam fuisse, Fætumque in eadem tanquam in altero *Utero* sive *Utriculo* contineri constet. *Fig.* 56.

Fig. 57. *Placentæ* Structuræ interioris pars prior cum *Embryo*. 1, Vesicula insignior Sanguine Rubicundo turgida. 2, Vesicula alia Flavo Liquore repleta. 3, Vesicula maxima Flavo Liquore distenta. 4 4 4 4, Vesiculæ circumsitæ minores, varia proportione, varioque Liquore, Rubicundo, Flavo, Limpido, plenæ. 5. *Umbilicalis Funiculus* cum Vasis. 6, *Embryon*; Figuræ, Magnitudinis, Manuum & Pedum Situs, Penis, Podicis Caudati, Foraminis *Ani* quasi à Meconii nigrore punctati, Helices Auriculæ, Rictus Oris, accuratâ Omnium Delineatione. 7, Locus in quo *Funiculi* Tunica Vesicularum latebris se insinuabat. 8 8 8 8 8, Spatium Vesiculis vacuum, *Chorio* & *Amnio Placentæ* crepidinibus annexis. *Fig.* 57.

Fig. 58. *Placentæ* Structuræ interioris pars altera sine *Embryo*. 1 1 1, Vesiculæ variâ Magnitudine, varioque in eis Liquorum Colore. 2. Vasa sanguinea hinc inde commeantia. 3 3 3, Spatium Vesiculis Vacuum, *Placentæ* Expansionem cum annexa *Chorii* Tunica ostendens. 4 4 4, Lacinia *Chorii* cum *Placentæ* divulsæ parte graciliori. 5. Foramen à *Placentæ* & *Chorii* ruptura. *Fig.* 58.

Fig. 59, *Embryon* exhibens. *A*, *Embryi* Corporis habitudo. 1, Linea Alba *Frontem* dividens. 2 3, Duæ alæ Lineæ Albæ ad *Suturam Coronalem* tendentes. 4, Duo Puncta quæ *Narium* Foramina designant. 5, *Helix Auriculæ* Albicante Lintâ discreta. 6, *Penis*. 7, *Pedum Digiti* inequaliter desinentes, cum exiguis lineis Fissurarum Indicibus; eadem ratio *Manuum*. 8, *Caudæ* eminentia, cum punctato *Ani* Foramine. 9, Oris Rictus. 10, *Medulla Spinalis* Albicans, utrinque à se versus Latera exiles lineas Albas, equaliter curtas, dimittens. 11, *Umbilicalis Funiculus*, per cujus Tunicam exilia Vasa transparent. *Fig.* 59.

CVII. It is much controverted, whether a *Fætus* does *Respire* while in *Utero Materno*, there being only a continued Circulation from the Mother to the Child, and from the Child to the Mother, by means of the *Placenta* and *Cordon*, so that the *Lungs* of the Mother serve for both, and that the Blood Circulates a much shorter way by the *Canal* of *Communication* and *Foramen Ovale* without passing the *Lungs*, than it does after the Birth, the Child having then the proper use of its own *Lungs*, the former Passage being so Mechanically stopt by a *Valvule*, that the Blood quite alters its former Channel or Course, as I have seen it, to my great Pleasure and Satisfaction, Demonstrated on several *Fætus*'s Dissected on that account in the Private Lectures of M. *du Verny*. And that the thing may appear more clear, I shall mention two Opinions that obtain most as to the *Nourishment* of a *Fætus*.

The Respiration and Nourishment of a Fœtus in Utero Materno; by Dr. Charles Preston. n. 226. p. 464.

The *First* is, That there are a Number of *Glands* in the Internal Tunick of the *Matrix*, which all the time of Child-bearing Filter and ſeparate from the Blood a White Liquor, like unto *Chyle*, that is receiv'd by the *Glands* of the *Placenta* (which is nothing but a heap of Glands and Veſſels) that are join'd with thoſe of the *Matrix*; hence in Brutes they can ſeparate the *Placenta* from the *Matrix* without the Effuſion of Blood, but only of that White Liquor, the *Umbilical* Veins and Arteries being diſtributed to all the *Glands* of the *Placenta*; ſo that the Capillary Veins receive that Liquor with the Blood, and carry it to the *Vena Porta* of the Child, and from thence to the Heart, to be diſtributed through the whole Body; and what is ſuperfluous, is carry'd back to the *Placenta* by the *Umbilical* Arteries, and ſo continues to Circulate from the *Placenta* to the Child, *& vice verſa*.

By the *Second* Opinion, they pretend, That the *Umbilical* Veſſels are diſperſed through the *Placenta*, and that the Capillary Veins of the *Placenta* are *Anaſtomoſed* with the Capillary Arteries of the *Matrix*, from whom they receive the Blood that is carry'd to the Child for its *Nouriſhment*, and the remainder is carry'd back by the *Umbilical* Arteries which are *Anaſtomoſed* with the Veins of the *Matrix*; ſo that the Circulation is made from the Mother to the Child, and from the Child to the Mother, by means of the *Placenta* and *Umbilical* Veſſels.

Which of theſe Opinions are the moſt Probable, depends upon the Anatomy of the Parts, but any of them will ſerve my turn, *viz.* to prove there is a continu'd Circulation from the Mother to the Child, and from the Child to the Mother. And to confirm it, I ſhall produce two or three Experiments which I had occaſion to ſee perform'd. The firſt was on a *Fœtus*, by M. *du Verny*, where by blowing into the *Umbilical* Vein, and tying the Arteries, a little after the *Umbilical* Arteries were diſtended. The Second Experiment perform'd alſo by *M du Verny*, was upon the Diſſection of the *Uterus* of a Woman newly brought to Bed, by blowing into the *Hypogaſtrick* Artery, the whole Veſſels were fill'd, and the *Matrix* blown up; and for a farther Trial he made an Injection, by which the Liquor came forth at the Orifices of the little *Glands*, which are diſpers'd through the *Matrix*. This Experiment cannot be perform'd but only in ſuch Caſes. The 3d. Experiment I ſaw perform'd by M. *Bidloo*, *Profeſſor* of *Anatomy* at *Leyden*, on a *Fœtus*, where by an Injection of Wax into the *Umbilical* Vein, the whole Veſſels were fill'd both Veins and Arteries, at which he was a little ſurpriz'd, being contrary to his Doctrine. I could inſtance ſeveral other Experiments, but this is ſufficient to prove there is a continu'd Circulation from the Mother to the Child, and from the Child to the Mother; ſo that a *Fœtus* ſeems not to *Reſpire* but by the Mother: as M. *Mery* in the *Memoires de l' Academie de Science* has confirm'd by ſeveral Experiments: The Firſt was upon two Tortoiſes, by tying their Jaws ſtrongly together, and ſealing their Noſe and Throat with Spaniſh Wax, to try how long they could Live without *Breathing*: The firſt Liv'd 31 Days, the other 32. Another Experiment was by laying open the *Sternum* of a Dog, who Dy'd a little after; but having Lifted that of a Tortoiſe, it Liv'd yet 7 Days.

Although

Although their Reasons seem to be strong, that a Tortoise can Live so long without *Breathing*, having the *Canal* of *Communication* and *Foramen Ovale* always open, yet M. *Mery* pretends they are not Concluding, but by other Reasons quite different ; and that is by the continu'd *Circulation*, as we have said above, as he has several times observ'd in *Accouchmens*: That if the *Cordon* by which the *Fatus* is ty'd to the *Placenta*, was so presſed, that the Blood could not pass from the Mother to the *Fœtus*, and that the Head of the *Fœtus* is engag'd in the Passage, the *Fœtus* is *Choak'd* in a very little time; but if the Head is come forth, the *Fœtus* dies not, altho' the *Cordon* be strongly Compreſt by the rest of the Body.

An Egg found in the Tuba Fallopiona *of a Woman; by* M. Bussiere. *n.* 207. *p.* 11.

CVIII. Cestoit une Jeune Femme d' environ 25 a 26 ans, laquelle estoit *Accouchée* il n'y avoit pas long temps; ce que je Recognus, 1. par les Cicatrices de la Cuticule du *Bas Ventre* encore recentes; 2. par la Dechirure de la Fourchete dont la Cicatrice estoit toute nouvelle; 3, par la Grandeur de la *Matrice*; & en fin par l' Ouverture de l' *Ovaire* du costé Gauche, par laquelle l' *Oeuf* qui avoit servi a l' Enfant precedent, estoit sorti, laquelle estoit encore fort Large, & dont le rabord paroissoit encore un peu Dechiré; Cependant, quoyqu'il n'y éut pas long temps qu'elle fust *Accouchée*, soit par un esprit de Debauche, ou peut estre dans la Pensée que si elle devenoit Grosse, on ne la feroit pas Mourir, elle se divirtit avec quelque Ami, ou peut estre avec quelqu'un des Prisonniers, de maniere qu'elle Conçeut: mais ayant esté Executée avant que l' *Oeuf* Impregné de la *Semence Virile* eust eu le temps d'estre por é dans l' *Uterus*, lors que je l'ouvris; je trouvay que la *Trompe* du costée Gauche estoit extra rdinairement Dilatée vers son extremité, & ceste Dilatation dans la plus grande largeur estoit d'un peu plus d'un Poulce de Diametre, & s' estendoit un peu plus d'un Poulce & demi en diminuant du costé de la *Matrice*. Cette Partie ainsi Dilatée se recourboit & embrassoit presque tout l' *Ovaire*, a la Membrane du quel elle estoit si fort adherant, qu'elle n'en put-estre Detachée que par Force. Lors qu'elle en fust Detachée il en sortit une Liqueur Limpide & Onctueuse, laquelle servoit aparemment ou pour relacher les Membranes de la *Trompe*, a fin qu'elle se puisse Dilater de manier que l' *Oeuf* puisse couler aysement dans la *Matrice*; ou possible a fin de graisser ce Conduict a fin que l' *Oeuf* n'ayt aucune peine a y passer; & peut estre pour tous les deux. J' examinay dabord si je ne pourrois rien remarquer dans le Corps de la *Trompe*, qui put produire cette Liqueur: mais Je n'y pus rien remarquer, bien q' elle fust beaucoup plus Espaisse qu'a l'ordinaire. Cette Espaisseur estoit causée par le Gonflement de ses Fibres, qui estoient aussi charnus que ceux des Muscles ordinaires, ce qui arrive, sans dout, dans cet estat seulement, a fin de luy donner asses de Force & de Mouvement, pour exprimer l' *Oeuf* (apres qu'il est Detache de l' *Ovaire)* & le pousser dans la *Matrice*. Ma pensée est donc, que cette Liqueur contenüe dans la *Trompe* vient de l' *Ovaire*, & que les Fibres & les petits Vaisseaux *Lymphatiques* ou autres qui se rompent pour ouvrir un Passage a l'*Oeuf* Impregné, y laissent couler cette Liqueur, de sorte qu'encore que la Dechireur de l'*Ovaire* soit une playe & un Symptome, elle ne laisse pas d'estre utile, & de produire des Effects peut estre absolument

neceſſaires, ou pour la premiere Nourriture de l' *Oeuf*, ou pour la facilité de ſon paſſage dans la *Matrice* : tant la Nature ſait mettre toutes choſes a Profit. Ce qui me Confirme dans cette Penſée eſt, que dans les Femelles des Animaux, de l' *Ovaire* des quels ſe Detachent pluſieures *Oeufs* a la fois, cette Liqueur s'y trouve en tres grande quantité. J'ay depuis peu eſté aſſez Heureux que de trouver dans une Truye, la meſme Diſpoſition que dans la Femme, dans laquelle les *Trompes* de chaque coſté qui embraiſſoient l' *Ovaire* contenoient chacune environ trois a quatre *Onces* de cette Liqueur.

La *Trompe* eſtant Detachée de l' *Ovaire*, & la Liqueur eſcoulée, l' *Oeuf* parut a decouvert, il eſtoit de la groſſeur d'une Noiſette entouré de la Liqueur au milieu de la cavité Dilatée de la *Trompe*, les trois quarts de cet *Oeuf* eſtoient deſia hors de l' *Ovaire*, par le trou qu'il y avoit faict, en ſorte qu'il ſembloit n'y tenir plus, cependant lors que je voulus l'oſter, je le trouvay encore attaché par un Pedicule aſſez dur, au travers du quel paſſoient les Vaiſſeaux Sanguins pour s'aller diſperſer dedans & ſur l'*Oeuf*. C'eſt par ces Vaiſſeaux que le *Fœtus* reçoit la matiere de ſon Accroiſſement & de ſa Nourriture, non ſeulement dans l'*Ovaire* mais auſſi dans la *Matrice* ; ce Pedicule Devant ſervir a former le *Placenta* (ſi ce n'eſt pas le *Placenta* luy meſme, deſia formè dans l'*Ovaire*) en s'atachant au corps de la *Matrice* ; c'eſt auſſi par la qu'il faut concevoir que l'*Eſprit Seminal* du *Maſle* eſt porté dans le corps du *Fœtus* dans l'*Oeuf*, pour luy donner le Mouvement & la Fœcondité.

Il ne paroiſſoit encore point de Changement Senſible dans la *Matrice*, ſi ce n'eſt qu'il y avoit beaucoup de Mucoſité, ce qui eſt aſſez Naturel. La *Trompe* du coſté Gauche eſtoit dans ſon eſtat Naturel, auſſi bien que l'*Ovaire*, a l'exception de l'Ouverture par ou l'*Oeuf* de l'*Enfant* Precedent eſtoit ſorti.

Explication of the Figures.

Fig. 60. *Fig.* 60. *Matrice* de la *Femme*. *a a*, Le Corps de la *Matrice*. *b b*, La *Trompe* Dilatèe embraſſant L'*Ovaire d*. *c*, L'*Oeuf* Impregnè renfermé dans la *Trompe*. *E*, L'*Ovaire* Gauche. *F*, Le trou par ou l' *Oeuf* de l'*Enfant* Precedent eſtoit ſorti. *g*, La *Trompe* Gauche. *h*, L'Artere *Hypogaſtrique*. *I I*, Les Ligaments *Ronds*. *K*, L' *Oeuf* detache de l'*Ovaire*. *L*, Le Pedicule par le quel il tenoit encore a l'*Ovaire*.

Fig. 61. *Fig.* 61. *Matrice* de la *Truye*. *a a*, La *Vagina*. *b*, La *Vulve*. *c*, La *Veſcie*. *d d d d*, Les *Cornes* de la *Matrice*. *E E*, Les *Trompes*, ou *Tubæ Fallopianæ*. *F F*, L' extremite des *Trompes* Dilatèes, embraſſant les *Ovaires*, & pleines de la Liqueur. *g*, Appendix des *Trompes*. *H H*, Les Arteres de l'*Uterus*. *i i i i*, Les *Oeufs* comme ils ſortent de l'*Ovaire*. *K K*, Une des *Trompes* detachée de partie de l'*Ovaire*.

A Fœtus form'd in the Ovarium ; *by M.* de S. Maurice. *n.* 150. *p.* 285

CIX. Madam *de Saint Mere*, had been ſafely brought to Bed 8 Times : and after having continued 5 Years without being with Child, about 3 Months before her Death ſhe ſuſpected her ſelf to be fallen into that Condition again ; becauſe having never failed of being very regular, and not finding her ſelf Ill, ſhe was more than a Month without her ordinary Relief. But whilſt in this State ſhe had a little Show, which ſcarce left her wholly during the two laſt Months of her Life, and which ſhe paſt never

vertheleſs without much trouble, ſo that ſhe thought her ſelf to be ſecure, as to the Point of her being with Child. But 22 *Apr.* 1682, after ſhe was up in the Morning in very good Health, ſhe fell into *Faintings*, which made her looſe abſolutely her *Pulſe* from that Moment without depriving her of her Underſtanding or Speech. About 8 a Clock in the Evening I came to her. I found her Cold, her Countenance Deadiſh and cover'd with a Clammy and Cold Sweat, having ſtill an entire Underſtanding and her Speech ſtrong. She complain'd of a great *Colick* in the Region of the Right Groin, which terminated at the Reins: This *Colick* was ſo violent, that as I was going to touch the place, ſhe prayed me not to preſs it, and told me, I ſhould make her fall into a *Swoon*. In a Moment after, ſhe felt all the *Præludium's* of an imminent *Travel*; ſhe call'd her Chirurgion and Dy'd in his Arms ſaying, *I am Delivering, I am Delivering*; there appearing outwardly neither Diſtillation, nor Flooding, nor any mark of this Diſorder.

M. *de la Cheſe* was made choiſe of to open the Body. As ſoon as he had open'd the *Integuments* of the *Belly*, we ſaw in the *Epigaſtrick* Region all the Entrals floating in Blood: I caus'd 2 ℔. to be taken forth with a Spoon, to avoid changing the Situation of the Parts; after which, ſeeing that there remained in the Right Flank a prodigious Quantity which was Coagulated, I try'd my ſelf to take it out with my Hand; and amongſt the firſt Clots, which I drew forth, I found a little *Fœtus* about the bigneſs of a Thumb, and a 3d leſs in Length, all very diſtinctly form'd, and in which was manifeſtly diſcover'd the Sex of a Boy, but Naked and without Covering. Two Fingers from this place I found the Right *Cornu* of the *Womb*; but I was amaz'd when I found the *Teſticle* torn longways and thro' the middle on the ſide, that it did not touch the *Tuba*, and all its Cavity full of Clotted Blood. I no longer doubted, but this was the place where this Infant was Form'd, and I conceiv'd that having acquir'd in this place a growth too great to be able to fall in time; and having continu'd to grow there without being able to come forth, it had at length broken its Priſon by ſtretching it. I was confirm'd in this Opinion when comparing this *Teſticle* with the Left, I found it at leaſt 4 times bigger, its greatneſs approaching that of an Hen's Egg, and the Left being not greater than a little Cheſnut; it was all Red without and within, beſides the Clotted Blood that it contain'd; whereas the Left was Pale, and full of little Grains of the Colour and Conſiſtency of Yellow Tallow. I examin'd the *Tube* on the Right Side; and I could not find that this Infant had ever entred there; it was in all things like the Left *Tube*. The *Womb* was every where without any Rent, and in a ſtate purely natural: I only obſerv'd, that it was a little bigger and ſofter than it is found in Women who dye without being with Child. It was all as Dr. *Harvey* has deſcrib'd it, in the firſt Month of *Pregnancy*: but when it was open'd, I found not the leaſt Signe of *Conception*. Indeed the Veſſels of the Interior Membrane appear'd to me full of Blood, and Varicous as it were, which doubtleſs was the Cauſe of that little Show of Blood, as before mention'd.

Authors ſpeak of certain *Fœtus*'s found in the *Tubes*; and of others that have been found in the Cavity of the *Belly*, the *Womb*, nor the *Tubes* being any

any way Torn: but I do not think that any Perſon hitherto has been able to ſhew, that the *Conception* is made in the *Teſticle* or *Ovarium*, as it ſeems to me that the Fact which I have now related manifeſtly Demonſtrates.

A Fœtus *lying without the* Uterus, *in the* Belly; *by* M. Saviard. *n.* 222. *p.* 314.

CX. 1. A Woman big with Child came to *l' Hotel-Dieu* to Ly-in of her 3d or 4th Child: and after exceſſive Pains about the *Navel* and the lower part of the *Belly* by the different Motions of the Child, ſhe dy'd there, 13 *Oct.* 1696. She was quickly open'd by M. *Colignon* and *Joui*, aſſiſted by the Chief Midwife, Mad. *de Gue*: They found the Child Dead, and not in the *Matrix* which was whole near it. They defer'd a further ſearch till the next Day, and ſent for many Eminent Phyſicians and Surgeons. We then examin'd the Body with Attention; and found that all the Parts that compoſe the *Matrix*, both inward and outward, as alſo the *Vagina* were very Sound: It was as big as it uſes to be in Women 10 or 12 Days after they are brought to Bed. The *Internal Orifice* was of a Livid Colour, occaſion'd by the ſeveral touchings of it, both before and after her Death. There was no mark of a Cicatrice or Hole, but thoſe of the Proceſſes call'd *Tubæ Fallopianæ*, which yet were hardly wide enough to admit of a Hog's Briſtle. All the Company did agree, that the Child was never Conceiv'd in the *Matrix*, and that it never had ſtay'd there. The Right *Teſticle*, or *Ovary*, was very Sound, but the *Tuba* and its Fringe were Rotten in the place where 'tis faſten'd to the Membranes of the *Peritonæum*, which form'd the *Bag* in which the Child was wrapt. The Left *Teſticle* was of the bigneſs of a Hen's Egg, full of a ſtinking *Serum*, and the Ligaments large; the *Tuba* and its Fringe were Rotten. The *Bag* was plac'd betwixt the *Matrix* and the *Straight* Gut, in the Cavity which is form'd by the bending of the *Os Sacrum*: The Child was on his Knees, lying towards the Right Side, and ſeem'd to have been Dead 7 or 8 Days; for the Scarf-skin, or *Epidermis* did eaſily ſeparate from the Parts under it. The Child had left its *Placenta*, tho ſtill faſten'd to it by the *Umbilical* Veſſels; and the *Placenta* being out of the *Bag* was on the Left Side, whence was voided a great Quantity of Blood into the Capacity. Its Edges being brought near to one another, repreſented a Bowl, ſuch as they play at Ninepins with. All the Membranes that form'd this *Bag*, and thoſe that encompaſt it, were Gangreen'd.

I believe that the Bigneſs which we obſerved in the *Matrix* proceeded only from a Reflux of Blood, and the Spirits which carryed the Nouriſhment to the *Fœtus* when it Lived.

By Dr. Fern. *n.* 251. *p.* 121.

2. A Goldſmith's Wife, near 9 Months gone with her 5th Child, was receiv'd into the *Hotel-Dieu*, 20 *Sept*, 1696. She was then about 34 Years of Age, of a Tender Conſtitution, had had 4 Children before, all which had done very well; but with the preſent ſhe had been very Ill, and endur'd a great deal of Miſery. The Midwife who examin'd her Body, found a conſiderable Riſing on the Right Side near the *Navel*, which very much reſembled a Child's Head, her *Belly* below that place bearing no proportion to that above, or to the time of her *Pregnancy*. On the Left Side there was nothing ſingular. The Midwife thought ſhe felt, through the *Vagina*, a thick

thick Membrane fill'd and diſtended with Water, and in it the Heel of a Child bent towards the Thigh; but ſhe could not be aſſur'd whether this was within the *Womb* or not, by reaſon the *Inner Orifice* was drawn ſo high, under the *Os Pubis*, ſhe could not, without ſome difficulty, touch it with the extremity of her Finger. Upon trying ſometime after, ſhe could not diſcern any thing like the *Fœtus* ſhe had before felt. The Patient told her, That for the firſt 6 Weeks after her being with Child ſhe had great and continual Pains, which ſhot towards the *Navel*, and terminated there; and theſe laſted till the 3d Month; That from thence to the 6th ſhe had frequent *Convulſions*, *Apoplectick* Fits, and terrible *Syncopes*, ſo that thoſe about her deſpaired of her Life; That from the 6th to the 8th Month, ſhe had enjoy'd a much better Health, which in ſome meaſure had ſtrengthned both her and her Infant; That the Pains ſhe had endur'd ſince that time ſeem'd to be ſo many alternate *Throes*, (probably proceeding from the repeated Strokes of the Child's Head in that place, where the *Teguments* were ſo thin, by reaſon of their great Extenſion, that the hardneſs of the *Cranium* could plainly be diſcern'd through them). In this Condition was this miſerable Woman when ſhe was receiv'd into that *Hoſpital*, till her Affliction increaſing, ſhe could not lye on her Side or Back, being forc'd to ſit in a Chair, or Kneel in her Bed, with her Head reſting on her Breaſt. Theſe ſtrange and unaccountable Symptoms oblig'd the Midwife to conſult with the Phyſician and Maſter Surgeon of the Houſe, who thought it was beſt to leave the Work to Nature, and prepare the Woman for her *Labour*, by opening a Vein in her Foot. The Evacuation was order'd to be ſmall (in which regard was had to the Weakneſs of the Patient, and the Nicety of her Conſtitution.) However, after this time the *Child* made no Efforts, and the Tumor ſubſided, there remaining only an *Hydropick* Indiſpoſition, which might be perceiv'd by the Fluctuation; and a great quantity of Water came away for ſeveral Days, from the *Orifice* of the Vein; inſomuch that ſhe who ſeem'd to have her Lower Belly and Thighs extreamly Diſtended, was very much extenuated before her Death.

After her Deceaſe her Body was open'd by M. *Jouey*: And upon the firſt Inciſion through the *Teguments*, there came away 2 or 3 Pints [of *Paris* Meaſure] of Water and Blood, and there appear'd the Head of a Child Naked; and when the parts were all laid open, there was found an entire Female *Fœtus* contain'd in a ſort of Cover or Bag, which at once ſerv'd it both for a *Womb* and Membranes. M. *Jouey* took the Child with the *Umbilical String* out of the Mother's Belly, tracing the *String* to the *Placenta*, into which it was inſerted. This laſt appeared like a great round Lump of Fleſh, and adhered ſo firmly to the *Meſentery* and *Colon* on the Left Side, that it could not be ſeparated from them without ſome trouble. On one ſide of this Lump was a leſſer, about the Size of a *Kidney*, which principally adhered to the *Meſentery*, and receiv'd ſeveral Branches of the *String* into it. The larger Lump was Round, and the greateſt part of it adher'd to the *Bag*, or Caſe which contain'd the Child. This Caſe or *Bag* was corrupted and Mortify'd in part, which probably might proceed from the frequent Strokes of the *Infant*'s Head. It

ſprung

ſprung from the Edges of the *Tube*, or *Fimbria* of the Right *Ovary*, which was more entire than the Left, and proceeded obliquely to the Left Side, terminating at the Bottom of the *Pelvis*. In its deſcent it ſent out a ſmall portion between the *Womb* and the *Rectum*. This *Bag*, by compreſſing the Neighbouring Parts, had gain'd a conſiderable Space in the above-mention'd Cavity; in ſuch manner, that a great part of the *Child*'s Body was lodg'd at the bottom of it, in a Bended Poſture, with the Head projecting forwards which form'd the Prominence near the *Navil*. This *Bag* ſeem'd to be nothing elſe than an Elongation and Diſtention of the *Tube*, and an Expanſion or Production of the *Broad Ligament* on the Right Side, which was evident from its Continuity to thoſe Parts and the Diſtribution of the *Spermatick Veſſels*, which were larger than uſual, and paſſed from the extremity of the *Tube* to the larger Lump. The *Womb* was entire and in its natural State, except that it was ſomething larger than ordinary, being about the Size of that of a Woman 10 or 12 Days after her *Delivery*, and no marks that the Child had been lodg'd in it.

M. *Jouey* having obſerv'd this, thought fit to deſiſt till ſeveral eminent Phyſicians and Surgeons were call'd, and then the *Womb* being carefully Diſſected, it was unanimouſly agreed that the *Fœtus* had never been in it, [it being, as it was noted above, in the ſame State as in Women who are not with Child, except the ſmall Dilatation of its Bulk, which might ariſe from a Compreſſion of the Veſſels, and Interception of the Refluent Blood, by the unnatural Poſition of the *Fœtus*.] In thruſting a long and ſlender Probe through the Right *Horn* of the *Womb*, it eaſily paſs'd into the *Tube* of the ſame Side, for 3 Fingers breadth in length, but it could not be thruſt further by reaſon of the Conſtriction of the *Tube* in that part. The Capacity of the *Tube* could not be diſtinguiſh'd, the *Parietes* of it, by their Coalition with the *Chorion* and *Amnios* of the *Child*, forming the *Bag* in which the *Child* was Included, which extended from the *Tube* on the Right Side to that on the Left, and was agglutinated to the *Viſcera* of the *Lower Belly*, the *Rectum*, and to the back part of the *Womb*, as appear'd by ſome Fragments remaining on thoſe Parts after the Separation.

A Fœtus in the Right Horn of the Uterus; by Dr. Fern. n. 251. p. 125.

CXI. In Diſſecting the Body of a Woman, who ſuppos'd her ſelf to be 3 Months gone with Child, I found the *Womb* very ſmall, not larger than in Virgins, and a Hard Subſtance in the Right *Horn*, which being open'd, appear'd to be the *Sceleton* of an *Infant*, with the *Navil-ſtring*, ſmear'd round with a white Matter not unlike Plaiſter.

A Woman with Child, notwithſtanding a Coaleſence of the Vagina Uteri; By ..... n. 237. p. 56

CXII. Ad Fœminam in *Puerperio* enitentem, ante aliquot Septimanas accerſitus eram, quæ *Parturientis* Doloribus per biduum laboraverat; abſque ullo tamen Effectu, nam ne Guttula quidem Sanguinis aut Aquæ adhuc effluxerat. Nec mirum; *Vagina* enim *Uteri* (paulo ſupra *Ductum Urinæ*) firmiter Coaluerat, & latera ejus tam arctè unita erant, ac ſi ſemper unica eſſent Membrana non prius perforata. Ab ejus Marito interrogabam quam diu Vulva tam Clauſa eſſet: reſpondit, per Quinquennium; *viz.* a tempore prioris

prioris *Puerperii*, quo in difficili Partu huic Obstetricaveram. Quod *Coalescentia* tam arcta erat, non Tactu solum, sed Visu deprehendi. Post integram fere diem, multos forteſque Enixos, una cum auxilio manus Obstetricis, aliquantulum Aperta (& ni fallor Lacerata) erat Membrana; adeo ut Digito minori daretur Ingressus: hanc Apertionem (ut ad Partum conduceret) per *Speculum Matricis* Dilatare visum est; hoc facto magna Hæmorrhagia statim sequebatur, unde infælix Fæmina ita debilitata erat, ut 6 vel 7 horis à Partu Infantis mortuæ expiravit.

In Animo etiam atque etiam volutanti, quomodo fieri posset ut in *Utero* conciperet hæc Mulier, ad quem Membrum Semenve Virile nunquam accederat, mihi in Mentem venit Opinio doctissimi *Harvæi* nostri in Libro *de Generatione* divulgata (cui ob hanc demonstrationem assentire cogor) *viz.* quod Fætus non formatur ex *Semine Masculino* in *Uterum* ejecto, sed tota Massa Sanguinis (quasi per Contagium) vim Plasticam à Semine Virili accipiens *Ovis Uterinis* communicat, unde fiunt fertilia: & eo magis cum illo sentio, quoniam scio hanc Fœminam Infantulum vehementer appetiisse, unde proculdubio eo majori desiderio cum viro rem habuit; & maxime probabile videtur, quod inflatis Mulieribus instante coitus, Spiritus eo tunc temporis affatim affluentes Effluvia aliquot à Semine Virili attraxerunt, Sanguinisque Massæ & deinceps *Ovis Uterinis* Fæcunditatem communicarunt.

Nota, quod non obstante hac *Clausura* frequenter per Menses purgata erat antequam *Utero* concepit.

CXIII. 1. *Margaret Mathew*, Wife of *John Puget*, Shearman, (at or near *Tolouse*) being with Child 1652. perceived about the end of the 9th. Month of her Bearing, such Pains as Women usually have, when about to fall in Labour. Her Waters also broke: but no Child followed. For the Space of 20 Years, she perceived this Child to stir; with many troublesome Symptoms accompanying: But for the 6 last Years, she perceived not the Child to Move. She dy'd 18 *Jun.* 1678. and the next day, being opened, a dead Child was found in her *Belly*, out of the *Womb*, no way joyned or fasten'd to it; the Head downward; the Buttocks hanging toward the Left side. All the back-part of this Child was covered with the *Omentum*, which was about 2 Fingers thick, and stuck hard to divers Parts of the Body of it, not to be separated without a Knife; which being done, very little Blood issued. This *Infant* weighed 8 Pounds *Averdupoyse*. The *Scull* was broken into several pieces. The *Brain*, of the Colour and Consistence of Oyntment of Roses. The *Flesh* Red, where the *Omentum* stuck, other Parts Whitish, Yellowish, and somewhat Livid; except the *Tongue*, which had the natural Softness and Colour. All the *Inward* Parts were discoloured with a Blackishness, except the *Heart*, which was Red; and without any issuing Blood. The *Forehead*, *Ears*, *Eyes*, and *Nose*, were covered with a Callous Substance, as thick as the breadth of a Finger. The *Gums* being cut the *Teeth* appeared in the Adultness of those in grown Persons. The Body had no bad Smell, though kept 3 days out

A Child 26 Years in the Mothers Belly, out of the Uterus; by Dr. Bayle. n. 139. p. 979.

of the Mother's Belly. The length of the Body, from the Buttocks to the top of the Head, about 11 *Inches*. The Mother died about the 64th Year of her Age.

By . . . . n. 140. p. 1001. Vid. Sect. CIV.

2. This Hiſtory of the *Fœtus*, and that of an *Hydropick Teſticle* (menti-on'd above.) may be two Arguments farther to ſatisfy thoſe who have hitherto doubted of the *Female Teſticle* it's being an *Ovary*. The former proving the *Veſicles* thereof with the Humour or Humours they contain, to be the *Eggs* out of which the *Fœtus* is bred. Which as they are uſed to enter into the *Womb* by the *Fallopian Tube*: So in this Caſe, it is moſt likely that the *Egg* falling off the *Ovary* into the ſaid *Tube*, by ſome pre-ternatural Contraction of its Lower Orifice, was ſtopp'd from iſſuing thence into the *Womb*. Yet being, it ſeems, near enough to receive the *Vital Con-tact*, it thereupon began to be enlarg'd; and ſo, by reaſon of its own in-creaſing Bulk, was made gradually to ſlip back again towards the Upper and Larger Orifice of the ſaid *Tube*, and at laſt to drop thence into the *Cavity* of the *Abdomen*; which now, inſtead of the *Womb*, became its *Neſt*. The Latter ſheweth, That it is poſſible for the ſaid *Veſicles* or *Eggs*, to be enlarged, upon Conception, as much as is neceſſary for the Generation of a Child: That is to ſay, when within the *Womb*, as much as they were in that Caſe, upon the *Ovary*. So that it is not, I conceive, reaſonably to be doubted, but the Membranes, which we call the *Secundine* or *After birth*, are the Individual Ones, which belong to that *Veſicle* or *Egg* which falls from the *Ovary* into the *Womb*: Being therein with their contained Hu-mour, Naturally augmented and amplified, as there they were Preternatu-rally, in that *Hydropical* Caſe.

The Bones of a Fœtus voided per Anum, ſome Years after Con-ception; by Dr. Ch. Morley. n. 227. p. 486.

CXIV. De præternaturali hac *Fœtus* Excretione, 40 penè Annorum In-terventu à nobis remota, rem totam, prout ab ipſius Puerperæ Amicis & Familiaribus relata mihi erat, ſic Accipe. Mulier quædam plebeia, ſed non inconcinna, Nomine *Maria Kid*, 30 circiter Annos natu, Fœtus antea enixa, habitans in Pago dicto *Swaſy*, &c. circa Annum 1658. impræg-nata cæpit *Utero* ingraveſcere. Per totum *Gravidationis* decurſum ordinaria Symptomata, ſuo quæque tempore, ſe oſtendebant; Obſtetricem tandem ac-cerſit, & expectatos *Parturientium* Dolores paſſa eſt: Quod cum poſt ali-quot dies nihil promoveri ſentiret, & remittente Dolore omni, ſupereſſet tamen *Abdominis* Tumor; admirabunda Animi, ad uſitata tamen munia ſeſe confert; Excurrit alter Annus integer, at illa à *Ventris Onere* neuti-quam liberata eſt; excurrit & ſemialter, manent miſeriæ. Attonita itaque Mulier Morbum ſuum extraordinarium extraordinario Remedio tentat abi-gere: Erat enim tunc temporis in Oppido *Sti. Ivonis* Ruſticus quidam, & Abſurdus planè Sordiduſque homo, qui cum Filius eſſet Natu Septimus, pro-prietate Naſcendi conſecratus eſt in Morborum Terriculamentum. Hic Vir itaque, ſive Arcanum hocce Medicum, cum ad Miſeram accerſeretur, non ingrato quopiam Medicamine, ſed mera loci Affecti attrectatione, opitalatu-rum ſe pollicetur. Credidit Ægra, (tantum Religio potuit ſuadere,) con-vocatis itaque vicinis Mulierculis, diſciſsâque circa utrumque *Hypocondrium* camiſiâ,

camisiâ, *Ventrem* suum ambabus Manibus demulcendum Ægra præbuit: Illa vero *Uteri* quasi Benedictione finitâ, Cystim ligneam parare jussa est, & quicquid *Utero* exiret in ea recondere. Nulla mora, in præsto stat Arca; post duas circiter Hebdomadas Officulum non per *Uterinas* vias, sed per *Anum* rejicitur, & per aliquot temporis intervalla alia per multa excernuntur; quamdiu enim ultro statutos *Gravidationis* terminos *Utero* intumuerat Mulier, tantundem plane temporis in deficiendis istis Sedibus *Ossеis* emersa est. In Arca omnia religiosissime reponuntur *Ossa*, quorum tantus erat numerus, tot distinctæ apparebant *Calvariæ*, ut tres *Fœtus* in *Utero* Materno tam diu intumulatos jacuisse omnes existimarent. Ipsam vero Matrem post tam diuturnas Cadaverosi Partûs ærumnas incolumem tamen præstitit ἡ φύσις, νόσων ἰήτειρα, & quem priùs Abscessum pro *Fœtus* exitu molita erat, eadem jam resarcivit, & sic quæ priùs *Obstetricis*, jam Medici partes agebat. At tantis Beneficiis frui nescivit inconsulta Mulieris temeritas, post duos enim Annos, cum ad Nundinas *Sturbrigenses* prope *Cantabrigiam* habitas, Equo Succussore veheretur, recrudescente, ob Motus Violentiam *Ulcere*, extincta est.

CXV. A Negroe-Woman, belonging to Capt. *Mead* in *Nevis*, about the 17th Month of her being with Child, was reliev'd after this manner. Her *Navil* Impostumated and broke of it self, and after it had voided some Quantity of *Ichorous* Matter, whereby she had some Ease, it left off. In about a Month more it Impostumated again to a far greater degree than before, whereupon, the Chirurgeon being sent for, he, where it did seem most jetting out, which was the *Navil* it self, did lay it open with a large Lancet; and then, after voiding a great deal of thin *Ichor* and Matter, there appear'd some *Bones* which prov'd to be a *Child*, that the Flesh was decay'd from, the which did stink much. But after the Extraction of the *Bones*, the Woman recover'd: And I was told by the Chirurgeon, and several others, that she hath had a *Child* since.

A Fœtus voided at an Ulcered Navil; by Mr. James Brodie. n. 229. p. 580.

CXVI. *Margaret Parry* of *Hintbery* in *Berkshire*, in the Year 1668, was deliver'd of a *Child*, she continu'd indifferently well 2 or 3 Days after her Delivery; then new Pains came upon her, and for 3 Weeks together there came from her daily some Quantity of Corruption, with pieces of Flesh and Skin; and she continu'd dangerously ill for about 8 Weeks, at the end of which time she was reliev'd. After 2 Years she began to Breed again, had 3 Children in the 3 Years following, all which were drawn from her by *Violence*; during her *Lying in* with the last of these 3 Children, some *Bones* of a *Fœtus* came from her, after this several other *Bones* came away with her *Catamenia*, and several (amongst which were divers parts of the *Skull*, and some of the larger *Bones* of the Body of a *Fœtus*) work'd their way by degrees through the Flesh above the *Os Pubis*.

The Woman was alive and in Health in *Oct.* 1684. All the Children were born Perfect.

The Bones of a Fœtus voided above the Os Pubis; by..... n. 243. p. 292.

A False Conception; by Dr. Will. Cole. n. 172. p. 1045.

CXVII. Matrona quædam, Mente omnino constans, Pia, fide dignissima, & circa Prægnantes & Puerperas olim versatissima, Septuagesimum nonum Annum nunc agens, [*An. Sc.* 1670.] Se *Fœtum* Utero gestare jamdiu credidit, creditque adhuc, imo quod magis mirabere (forsan & Risu excipies) per totos septem elapsos annos gestasse. Dum illâ Negotiorum causa Quadriennio abhinc iter facerem, & à quibusdam, ipsa non minus credulis, Rei famam acceperam, Novitate permotus ad hoc Miraculum nulla mora contendi. Inveni Ventre multum Tumentem, non autem, qualis esse solet *Hydropicorum* Tumor apparuit, sed sursum, more *Gravidarum*, eminebat. Et dum plura scisciterer, nec illam (ut nec ejus Maritum, qui decennio minor uxore fuit) de *Ingravidatione* amplius dubitantem comperissem, petii ut tantæ Fiduciæ causam exponeret. Illa haud gravate respondit, se olim 10 liberos enixam, nec ab eo tempore per 28 annorum spatium Mensium Fluxum passam, in cum tandem satis copiosum incidisse, ex quo brevi post omnia *Conceptus* signa aparuerunt; inde nauseam, & Vomitiones subinde recurrentes, nec non & Inordinatam quorundam præ cæteris ciborum Appetentiam, ut *Prægnantium* mos est, invasisse, & per plures Menses perstitisse, Ventre paulatim *Intumescente*; postea solito tempore primos Fœtus *Motus* se percepisse, & exinde, Tumore indies aucto, *Motus* etiam tanquam ejusdem locum sæpe variantis, nunc ab una nunc ab altera Ventris parte, qui & tractu temporis invalescebant, sensisse; tandem (appellente usitato *Partus* tempore) ipsos *Parturientis* Labores subiisse, ut Obstetricem accersere necesse habuerit. Sed non adfuit *Lucina*: attamen licet Dolores illi evanuerint, haud *Detumuit* Venter; quin sæpius præ Dolorum recursu Obstetrix (quæ & ipsa, prout a nonnullis accepi, in eandem cum Domina sua Sententiam propenderat,) rursus accita est. Ab eo tempore *Motum* illum, sed vegetiorem persensisse asseruit, adeo ut Vestes frequenter Attolli ab Adstantibus conspectæ fuerint, Tumore, licet aliquantulum, haud tamen impense, aucto. *Mammæ*, quas & vidi & attrectavi, minime, prout Vetulis solenne est, flaccidæ, sed amplæ & distentæ (at non supra modum) Glanduliſque, more *Prægnantium*, distinctæ. Mihi quin etiam sponte affirmavit, Obstetricem sibi asseruisse *Orificium uteri Internum* æque tenerum & molle fuisse, ac in quavis Fœmina mox *Paritura*. Cum porro percontarer utrum inter decumbendum, cum à Latere ad Latus se reclinaret, Pondus ab uno in alterum devolvi perciperet, prorsus negavit, neque de *Mola* nil suspicari jussit, cum illam peritius dignosceret, quam ut hac in parte decipi posset.

Cis paucos dies illam revisi, eademque, ut retuli, denuo narrantem audivi, *Mammasque* in eodem statu comperi, *Ventrem* vero aliquanto magis *Intumuisse*, de cujus Tensione plurimum conquesta est. *Motus* autem magis, quam ante hac, vegetos se tum percipere dixit; atque ego manu supra Vestes admota, bis, dum pauculam illic moram facerem, ejusmodi *motum* nunc ex una nunc altera ventris parte sensi, qualem in verè *Prægnantibus* observasse memini. Toto hoc *Gestationis* (si ad ipsius mentem loqui liceat,) tempore nullum, saltem alicujus Momenti, sanitatis Dispendium passam se profitetur, nullis Symptomatis laborasse, nisi quæ *Gravidis* sunt familiaria,

&

& quæ etiam, dum *Puerpera* fuit, perpeti ſolebat. Cibos ſatis recte appetit, optimeque digerit: minime Piticuloſa eſt, prout *Hydropicis* uſui eſt, Urinamque ad Liquidorum aſſumptorum Menſuram proportionatam reddit, ad morem autem *Gravidarum* ſolito frequentius. Ædes Hortumque ſatis valenter obambulat, nec Baculi fulcimento indiget. Moderate dormit, ſed petulca *Ventris* Sarcina Matri ſuæ vix ultra Diluculum quietem indulget, verum *Culcitratu* cogit è lecto ſurgere; quo facto, & Cibis aſſumptis, illa ſe iterum, Somno parat, ſaltem mitius ſævit. Quoad Habitum corporis, Carnoſa eſt, Vultuſque nihil morbidi (me Judice,) intus latentis præ ſe fert, Nullum Tibiarum Pedumve toto decurſu unquam paſſa eſt Tumorem, nec vulgatum ullum *Hydropis* cujuſcunque, ſive univerſalis, ſive ipſius *Uteri*, Indicium, præter Solum, quem dixi, *Abdominis Tumorem* colligere potui. Nec tamen *Fœtum* Utero includi quiſquam, niſi qui Famæ ſuæ prodigus eſt, aſſeruerit; cum & Ætas, & Temporis à prima affectus Invaſione decurſi longitudo, in tam abſonam Sententiam inſurgant.

CXVIII. 1. The Wife of one *Taylor* a Taylor in *Heywood* in *Staffordſhire* about 24 or 25 Years of Age, being married about a Year, in *Jan.* $168\frac{4}{5}$. fell into *Travel*, and after 5 or 6 Days, the Child being Dead was brought away with fit Inſtruments; And when Mr. *Birch*'s Wife had alſo brought away the *After-Birth*, ſhe perceived ſomething ſtill remaining, which ſo firmly Adhered to the Womb, that it was very difficult and painful to ſeparate it, and occaſioned a large Flux of Blood.

A Preternatural Conception *in* Staffordſhire; *by Mr.* Sampſon Birck. n. 150. p. 281.

It is further Obſervable, that the *Child* was perfectly Formed; that the Mother recovered; that before Marriage ſhe was never troubled with any remarkable Diſtempers; and that this *Monſtrous Subſtance* was not obſerved to be included in any *Cyſtis*, the *Secundine* being all brought away before it.

2. I have had an Opportunity of Obſerving this *Preternatural Body*, and of diſcourſing Mr. *Birch* himſelf. It's *Shape* may be eaſily conceived by the *Figure*. In the uppermoſt part thereof was a round protuberant *Bone* $3\frac{1}{2}$ Inches in compaſs, covered with a thick fleſhy Skin, beſet with ſhort Hairs. In the top of this Bone in a Circle were placed 8 *Dentes Molares*, which ſo exactly reſembled *Teeth* as to their Shape, Whiteneſs, Hardneſs, and in all other Circumſtances, that they can certainly be nothing elſe. 1. A little below this, in another Bone (which yet was faſtned to the former) were placed 5 other *Dentes Molares*, 4 of which made almoſt a ſtreight Line, but ſome diſtance in the middle, and the 5th was a little out of rank, being placed below the two uppermoſt. The remaining part compoſed a large *Cyſtis* or Bag, fill'd with a Liquid Slimy Matter, but not Fœtid. This *Cyſtis* on the outſide was Smooth, appeared ſomewhat Red, and was about the thickneſs of the *Scrotum*.

By Dr. Edw. Tyſon. *ib.* 1. 282. *Fig.* 62.

A little below the Bone (in which were ſet the 8 *Teeth* before deſcribed) we obſerved a large lock of *Hair*, of a bright Brown Colour, whoſe end was intricated and intangled in a large quantity of *Hair*, of a more faded and Yellowiſh Colour, which was faſtened to the end of the *Cyſtis* oppoſite

to

to theſe *Teeth*. But that this Lock of *Hair* was of a conſiderable length, we eaſily gueſſed by the ſeveral ſmall Curles we obſerved in the yellowiſh Hair, which were of the ſame Bright Colour with the former Lock. In the middle of the Circle of the 8 *Teeth*, I obſerved a ſmall Hole, but which did not lead far.

Vid. Sup. *Cap.* I. *Sect.* X. 4. H.

What moſt I can parallel this *Monſtrous Body* with are thoſe Inſtances of *Teeth*, *Bones* and *Hair* met with in the *Ovaria* of Women by Dr. *Sampſon* and my ſelf: But our preſent Inſtance differs from them, in that this was in the *Womb*, and firmly adhering to it; the others in the *Ovarium*. In this the *Hair* was on the outſide the *Cyſtis*, and rooted in its Tunicle, in the others 'twas contained within it. But as the *Child*, which was perfectly Form'd, and with much difficulty at laſt brought from this Woman, I doubt not, at firſt, being included in the Egg, deſcended from the *Ovarium*; ſo likewiſe this *Subventaneous* Egg, I queſtion not, might be tranſmitted from the ſame place: and Nature who is never idle, being diſappointed of forming in this a perfect *Fœtus*, made the beſt of what the Matter would afford; and might produce theſe *Teeth*, *Bones* and *Hair*, which may be reckoned as *Animal Vegetables*.

Extraordinary Effects of Strength of Imagination; *by Dr.* St. Geo. Aſh. *Bp. of* Cloyne. n. 228. P. 334. n. 243. P. 393.

CXIX. 1. One *Eliz. Dooly*, of the County of *Kilkenny*, was aged 13 Years in *Jan.* $168\frac{6}{7}$. Her Mother, being with Child of her, was frighted by a Cow as ſhe milked it, thrown down and hit on her Left Temple, within an eighth of an Inch from her Eye, by the Cow's Tear. This Child has exactly in that place, a piece of Fleſh reſembling a Cow's Tear, about 3 Inches and a half in length: 'Tis very Red; has a Bone in the midſt about half the length of it; 'tis perforated, and ſhe Weeps through it; when ſhe Laughs it wrinckles up, and contracts to two 3ds of its length; and it grows in Proportion to the reſt of her Body. She is as ſenſible as in any other Part.

By Dr. Cyprianus n. 221. p. 291.

2. A Lady was lately delivered of a Girl, with a *Wound* in her Breaſt above 4 Fingers long; which obliquely from the Top downwards, from the *Sternum* to the Left ſide, ſtretched it ſelf over the whole Breaſt. I found that the *Wound* penetrated to the *Muſculi Intercoſtales*, and that it was at leaſt an Inch broad, hollow under the Fleſh round about the *Wound*: Beſides that, there was a *Contuſion* with a little Swelling (Red and Blue, as is uſed to be in *Contuſions*) at the lower part of the *Wound* in the Inſide. The Child came into the World without any force; and conſequently it got not this *Wound* in its *Birth*: but was occaſioned by Strength of *Imagination*; For about 2 Months before, the Mother was gone to Bed, and by Chance ſhe heard a Report that a Man had Murthered his Wife, and with a Knife, had given her a great Wound in her Breaſt, at which Relation ſhe changed, but not exceſſively.

Now my Opinion is, that the Child at that very Moment that the Mother was *Frighted* received the *Wound* in its Mother's Body, becauſe that the *Wound* was very Sordid; and the inſide, as well as the outſide, beſet with Slime, proceeding from the Water wherein the Child is uſed

uſed to lye in its Mother's Womb, and alſo very like a *Wound* received long ſince. But after 3 or 4 Days Dreſſing the *Wound*, beginning to come to *Suppuration* and *Mundification*, began to bleed very faſt with Streams when dreſſed and wiped; and it plainly, in all its Circumſtances, was very like a Freſh cut *Wound*, and being ſimply handled, as ſuch, it Healed up. The *Contuſion* alſo, whilſt that the *Wound* was Healing, began to come to *Suppuration*, and made a Gathering, and drew down the Matter and Blood towards the Back; for the Scituation of the Child was ſuch, that the Matter could not Aſcend to the Wound, out of which Swelling, when it was opened, Matter and Blood run out in the ſame Manner we uſed to ſee in a *Contuſion* made ſome Days. So that I judged this *Wound* wholly, even at the Birth of the Child, in that State (as I ſuppoſe it was) at that very Moment when the Mother was *Terrify'd*, except that it was covered with Slime as above-ſaid. And I ſuppoſe that this Accident remain'd ſo long in the ſame condition, becauſe no Air could come to it, and the Child lay all over in Water, which has a preſerving Vertue, inſomuch that it excludes the Air.

CXX. *Papers (of leſs General Uſe) Omitted.*

1. The Structure of the *Epiploon*; Extracted from the *Tetras Anatomicarum Epiſtolarum Marcelli Malpighii & Caroli Fracaſſati* de *Lingua* & *Cerebro*. n. 29. p. 552.

2. Experiments relating to the *Stone* and its Cure; propoſed by Dr. *Fred. Slare*. n. 157. p. 533.

3. Some late Obſervations by Dr. *Kerckringius*, concerning Eggs to be found in all ſorts of *Females*; Extracted from his *Anthropogeniæ Ichnographia*: with ſome Reflections thereon, by M. *Denys*. n. 81. p. 4018.

CXX. *Accounts of Books Omitted.*

1. *Caſpari Bartholini, Thomæ* Filii, *Diaphragmatis* Structura nova; una cum Methodo præparandi *Viſcera*. *Paris.* 1676. *in* 8*vo*. n. 130. p. 768.

2. De *Viſcerum* Structura; Exercitatio Anatomica *Marcelli Malpighii. Bononiæ.* 1666. *in* 4*to*, n. 44. p. 838.

3. Diſſertatio Anatomico-Medica, de *Motu Bilis Circulari*, ejuſque Morbis; quam publice olim habuit *Mauritius Van Reverhorſt*. *in* 8*vo*. n. 264. p. 610.

4. *Regn. de Graaf*, de *Succo Pancreatico*; Exercitatio Anatomico-Medica. *Lugd. Bat.* 1671. *in* 12*o*. n. 10. p. 178. n. 79. p. 3066.

5. De *Secretione Animali* Cogitata; Auth. *Guil. Cole.* M. D. *Oxon.* 1674. *in* 12*o*. n. 106. p. 134.

6. Traite du *Cancer*; ou l'on explique ſa Nature, & ou l'on propoſe les moyens les plus ſures pour le *Guerir* Morhodiquement. Avec un Examen du Syſteme & de la Pratique de Mr. *Helvetius*. par M. *I. B. Alliot*. *Paris.* 1698. *in* 8*vo*. n. 240. p. 199.

7. Recherches ſur la *Nature* & la *Gueriſon* des *Cancers* Par M. *Deſhayes Geudron*. M. D. A. *Paris.* 1700. *in* 8*vo*. n. 261. p. 476.

§. Tracta-

n. 128. p. 705. 8. Tractatus de *Ventriculo* & *Inteſtinis*; cui præmittitur alius de *Partibus Continentibus* in genere, & in ſpecie de *Partibus Abdominis*; Auth. *Franc. Gliſſenio.* M. D. *Lond.* 1676. *in* 4to.

n. 177. p. 1246. 9. *J. Con. Pejeri Merycologia*; ſive de *Ruminantibus* & *Ruminatione* Commentarius. *Baſil. in* 4to.

n. 263. p. 566. 10. *Petri Chirac* Diſſertatio Acàdemica; an *Paſſioni Iliacæ* Globuli Plumbei Hydrargyro præferendi? *Monſp.* 1694. *in* 12o.

Ib. p. 570. 11. *Chriſtiani a Steenvelt* Diſſertatio, de *Ulcere Verminoſo. Lugd. Bat.* 1697. *in* 4to.

Ib. p. 571. 12. *Godefr. Bidloo* Obſervatio, de *Animalculis* in Ovino aliorumque Animantium *Hepate* detectis. *Lugd. Bat.* 1698. *in* 4to.

n. 54. p. 1089. 13. *Nath. Highmori*, de *Hyſterica*, & *Hypochondriaca Paſſione*, Reſponſio Epiſtolaris ad D. *Willis. Lond.* 1670. *in* 4to.

n. 57. p. 1178. 14. Affectionum quæ dicuntur *Hyſtericæ* & *Hypochondriacæ* Pathalogia Spaſmodica Vindicata, contra Reſponſion. Epiſtol. *Nathanaelis Highmori.* M. D. Cui acceſſere Exercitat. Medico-Phyſicæ duæ; 1. De *Sanguinis* Accenſione: 2. De *Motu Muſculari.* Auth. *Tho. Willis.* M. D. *Lond.* 1676. *in* 4to.

n. 850. p. 309. 15. Tractatus de *Podagra* & *Hydrope*; per *Tho. Sydenham.* M. D. *Lond.* 1683.

n. 107. p. 164. 16. La Lettre de *Charles Drelincourt* à M. *Porreé*, ſur la Methode, pretendue Nouvelle, de *Tailler* la *Pierre*: Avectres autres à M. *Valot.* A. *Leide.* 1674. *in* 12o.

n. 34. p. 663. 17. *Regneri de Graaf*, M. D. Epiſtola, de nonnullis circa *Partes Genitales* Inventis novis. *Lugd. Bat.* 1668. *in* 16o.

n. 38. p. 750. 18. Ejuſdem, de *Virorum* Organis *Generationi* inſervientibus, *&c. Lugd. Bat.* 1668. in 12o.

n. 81. p. 4026. n. 82. p. 4052. 19. *Ejuſdem* de *Mulierum* Organis *Generationi* inſervientibus, Tractatus novus. *Lugd. Bat* 1672. *in* 8vo.

n. 24. p. 663. 20. *John Van Horne*, M. D. Obſervationum ſuarum, circa *Partes Genitales* in utroque Sexu, Prodromus. *Lugd. Bat.* 1668. *in* 16o.

n. 84. p. 4098. 21. *Joh. Swammerdami*, M. D. *Uteri Mulieris* Fabrica; una cum Methodo nova Caviiates Corporis ita præparandi, ut ſuam ſemper genuinam Faciem ſervent. *Lugd. Bat.* 1672. *in* 4to.

n. 64. p. 2074. 22. Diſſertationes Medicæ tres: 1. De Cauſis *Fluxus Menſtrui* Mulierum. 2. De Sympathia variarum Corporis Partium cum *Utero.* 3. De uſu *Lactis* ad *Tabides* reficiendos, & de immediato Corporis Alimento: Auth. *Franciſco Bayle*; M. D. *Toloſæ.* 1670. *in* 4to.

n. 171. p. 1020. 23. *Gualteri Charltoni* Inquiſitio Phyſica, de Cauſis *Catameniorum*, & *Uteri Rheumatiſmo. Lond.* 1685. *in* 8o.

n. 58. p. 1201. 34. *Nicolai Hobokeni* Anatomia *Secundinæ Humanæ. Ultrajecti.* 1669. *in* 8o.

n. 27. p. 506. 25. Diſquiſitio Anatomica de *Formatu Fœtu.* Auth. *Gualtero Needham.* M. D. *Lond. in* 8o.

n. 70. p. 2136. 26. *Theodori Kerckringii*, M. D. *Anthropogeniæ* Ichnographia; ſive Conformatio *Fœtus* ab *Ova* uſque ad *Oſſificationis* Principia, in Supplementum *Oſteogeniæ Fœtuum. Amſtelod.* 1671. *in* 4to.

27. *Chriſt.*

27. *Chriſt. Fred. Garmanni. Homo ex Ovo. Chemnitii.* 1672. *in* 4*o.* n. 86. p. 5049.

28. Of the *Formation* of *Fœtus's* by S. *Gieronymo Barbato*, Publick Profeſſor of Practical Phyſick at *Padua.* n. 74. p. 2224.

29. Tractatus 5 Phyſico-Medici, de Sale Nitro & Spiritu Nitro-Aereo; De *Reſpiratione Fœtus* in *Utero* & *Ovo*, &c. Auth. *Joh. Mayow* L. L. D. *Oxon.* 1674. *in* 8*vo.* n. 105. p. 101.

30. New and Curious Obſervations of the Art of Curing the *Venereal Diſeaſe*, &c. Written in *French* by M. *de Blegny*; *Engliſht* by *Walter Harrys.* M. D. *Lond.* 1676. *in* 8*vo.* n. 125. p. 622.

31. Tuta ac Efficax *Luis Venereæ*, ſæpe abſque *Mercurio* ac ſemper ſine *Salivatione Mercuriali*, curandæ Methodus. Auth. *Dav. Abercromby.* M. D. *Lond.* 1684. *in* 8*vo.* n. 160. p. 620.

CHAP. V.

The Humors, and General Affections of the Body.

I. IN the beginning of the Year 1683. I firſt diſcovered the *Viſible Circulation* of the *Blood* in the *Water-Newt*; which, I perceive, Dr. *Garden* has ſince hit upon, and mentions in a Letter to Dr. *Middleton*, *July* 17. 1685. I frequently ſhew'd it, both on the outſide without Diſſection, and in the inward Veſſels, to ſeveral Curious Philoſophers; particularly *May* 26. 1684. I opened (before our *Society* at *Dublin*) a *Water-Newt*, which I take to be the *Salamandra* or *Lacerta Aquatica*; in the Body of this Animal there are two long *Sacculi Aerei*, in which the *Blood-Veſſels* are curiouſly Ramify'd. To theſe *Blood-Veſſels* applying a *Microſcope*, I ſhewed the *Circulation* of the *Blood*, *ad Oculum*, as plainly as Water running in a River: and more Rapidly than any common Stream. The ſame Experiment I repeated again before them on the 2d of *June* following, and to thoſe that had good Obſerving Eyes, the *Circulation* was as *Viſible* outwardly on the Hands and Toes, as in the Veſſels within. But certainly the Appearance in the Veſſels on the two forementioned *Sacculi*, with the Beating, Emptying and Filling of the Heart, is moſt ſurpriſing.

The Viſible Circulation *of the* Blood; *by Mr* Will. Molyneux. n. 177. p. 1236

II. In a Sheep weighing alive 118 *l.* we found $5\frac{1}{4}$ *l.* of *Blood*: which is leſs then $\frac{1}{22}$ part of the Weight of the Sheep. In a Lamb weighing $30\frac{1}{2}$ *l.* when Living, there was but $1\frac{1}{2}$ *l.* of *Blood*: which is nearly $\frac{1}{20}$ part. In a Duck weighing alive 2 *l.* 14. *Ounces* 50 *Gr.* we found an Ounce and half and 53 *Gr.* of *Blood*: which is leſs than $\frac{1}{28}$ part. In a Rabbit weighing 10 *Ounces*, 7 *Dr.* and 50 *Gr.* we found 2 *Dr.* 57. *Gr.* of *Blood*: which is about $\frac{1}{30}$ part.

The Quantity *of* Blood *in* Men, *and the Celerity of its* Circulation; *by Dr.* Allen Moulin. n. 191. p. 433.

In the Right *Ventricle* and *Auricle* of the *Heart* of a Dog, I found 6 *Ounces* of *Blood*, after that I had injected into the *Jugular Vein* a Liquor that

Coagulated the *Blood*; I found a greater quantity of *Blood* in the *Heart* of another Dog, whom I treated after the ſame manner. The *Hearts* were much Diſtended by the *Blood* found in them. I ſhall therefore ſuppoſe that 4 *Ounces* only were received at a time by theſe *Hearts* without Force, that is Naturally. But I ſhall ſuppoſe a *Man*'s *Heart*, (tho' much larger, and his much larger Veſſels than thoſe I ſpeak of) to receive but 4 *Ounces* at each *Diaſtole:* and then Allowing 75 Pulſes to every Minute, there will be 4500 in an Hour, and 18000 *Ounces* of *Blood* tranſmitted in that time.

Now if we ſhall ſuppoſe that a *Man*'s *Blood* bears the ſame Proportion to his Weight, as that of any of the aforeſaid Animals had to its Weight, which in a Lamb was the greateſt, being $\frac{1}{20}$ part, it will follow that the quantity of *Circulating Blood* in a *Man* weighing 160 *l.* will not exceed 8 *l.* or 128 *Ounces*; according to which Computation the *Blood* will *Circulate* 140 times in an Hour. But let us ſuppoſe that inſtead of 8 *l.* the Maſs of *Blood* in ſuch a *Man* be 12 *l.* it will follow, that it will *Circulate* between 93 and 94 times in an Hour. From this *Celerity* of the *Circulation* of the *Blood*, we may give an Account of the Sudden *Refection* with Victuals, and particularly ſuch as are liquid; we may alſo account for the quick paſſing of *Urine*, from the ſame thing; and alſo the quick Motion of the *Chyle* into the *Breaſts* of *Nurſes*; without ſuppoſing unknown Paſſages, from the Stomach or any other part, into the *Bladder* and *Breaſts*.

Anatomiſts commonly ſuppoſe no more than *Half an Ounce* of *Blood* to get into the *Heart* at one *Diaſtole*; and the whole Quantity of *Blood* in the Body to be between 15 and 25 ℔. by which it may appear how their Computations and mine differ.

A Method of Tranſuſing Blood; by Dr. Lower. n. 19. 352. n. 20. P. 353.

III. 1. Firſt, take up the *Carotidal Artery* of the Dog or other Animal, whoſe *Blood* is to be *Tranſuſed* into another of the ſame or a different kind, and ſeparate it from the *Nerve* of the 8*th Pair*, and lay it bare above an Inch. Then make a ſtrong Ligature on the upper part of the *Artery*, not to be untied again: but an Inch below, *viz.* towards the *Heart*, make another Ligature of a running Knot, which may be looſen'd or faſten'd as there ſhall be Occaſion. Having made theſe two Knots, draw two Threds under the *Artery* between the two Ligatures; and then open the *Artery*, and put in a Quill, and tye the *Artery* upon the Quill very faſt by thoſe two Threds, and ſtop the Quill with a Stick. After this, make bare the *Jugular Vein* in the other Dog about an Inch and a half long; and at each end make a Ligature with a running Knot, and in the ſpace betwixt the two running Knots draw under the *Vein* two Threds, as in the other: then make an Inciſion in the *Vein* and put into it two Quills, one into the *Deſcendent* part of the *Vein*, to receive the Blood from the other Dog and carry it to the *Heart*; and the other Quill put into the other part of the *Jugular Vein*, (which comes from the *Head*) out of which, the 2d Dog's own *Blood* muſt run into Diſhes. Theſe 2 Quills being put in and ty'd faſt, ſtop them with a Stick, till there be Occaſion to open them.

All

All things being thus prepared, Faſten the Dogs on their ſides towards one another ſo conveniently, that the Quills may go into each other. After that unſtop the Quill that goes down into the firſt Dog's *Jugular Vein*, and the other Quill coming out of the other Dog's *Artery*; and by the help of two or three other Quills, put into each other, according as there ſhall be Occaſion, inſert them into one another. Then ſlip the running Knots, and immediately the *Blood* runs through the Quills, as through an *Artery*, very impetuouſly. And immediately, as the *Blood* runs into the Dog, unſtop the other Quill, coming out of the upper part of his *Jugular Vein* (a Ligature being firſt made about his Neck, or elſe his other *Jugular Vein* being compreſſed by ones Finger) and let his own *Blood* run out at the ſame time into Diſhes (yet not conſtantly, but according as you perceive him able to bear it) till the other Dog begin to Cry, and Faint, and fall into *Convulſions*, and at laſt Dye by his ſide.

Then take out both the Quills out of the Dog's *Jugular Vein*, and tye the running Knot faſt, and cut the *Vein* aſunder, (which you may do without any harm to the Dog, one *Jugular Vein* being ſufficient to convey all the *Blood* from the *Head* and upper Parts, by reaſon of a large *Anaſtomoſis*, whereby both the *Jugular Veins* meet about the *Larinx*.) This done, ſow up the Skin and diſmiſs him, and the Dog will Leap from the Table and ſhake himſelf, and run away as if nothing ailed him.

In the performing of this Experiment, theſe Circumſtances are to be Obſerv'd. 1. That the Animals be faſten'd at ſuch a convenient Diſtance, that the *Vein* or *Artery* be not ſtretched. 2. If the Pulſe fails beyond the Quill in the *Jugular Vein*, you muſt draw out the *Arterial* Quill, and with a Probe open the Paſſage again in both of them, that the *Blood* may have its free Courſe.

2. Inſtead of a Quill, take a ſmall crooked Pipe of Silver or Braſs, ſo ſlender that the one end may enter into a Quill, and having at the other end, that is to enter into the *Vein* and *Arterie*, a ſmall knob, and for the better faſtening them to it with a Thred; for this is much more eaſy to be managed than a Quill. *By ... n. 20. p. 356.*

IV. 1. It may be conſidered, in the Experiments of *Tranſfuſion*, that the *Blood* of the *Emittent* Animal may, after a few Minutes of time, by its *Circulation*, Mix and Run out with that of the *Recipient*. Wherefore to be aſſured in theſe Tryals, that all the *Blood* of the *Recipient* is Run out, and none left in him but the *Adventitious Blood* of the *Emittent*, two or three or more Animals may be prepared and adminiſtred, to *Bleed* them all out into one. *Conſiderations concerning* Tranſfuſion *of* Blood; *by ... ib. p. 357.*

2. It ſeems not irrational to gueſs aforehand, that the *Exchange* of *Blood* will not alter the Nature or Diſpoſition of the Animals, upon which it ſhall be practiſed; though it may be thought worth while for Satisfaction and Certainty, to determine that point by *Experiment*. The Caſe of *Exchanging* the *Blood* of Animals ſeems not like that of *Graffing*, where the Cyons turns the Sap of the Stock, Graffed upon, into its Nature; the Fibres of the

Cyons ſo ſtraining the Juice, which paſſes from the Stem to it, as thereby to *Change* it into that of the Cyons, whereas in this *Transfuſion* there ſeems to be no ſuch Percolation of the *Blood* of Animals, whereby that of the one ſhould be *Changed* into the Nature of the other.

3. The moſt probable uſe of this Experiment may be conjectured to be, That one Animal may Live with the *Blood* of an other; and conſequently, That thoſe Animals that want *Blood*, or have corrupt *Blood*, may be ſupplied from others with a Sufficient Quantity, and of ſuch as is Good: provided the *Transfuſion* be often repeated, by reaſon of the quick expence that is made of the *Blood*.

Experiments of Transfuſing Blood; *by Dr.* Lower. n. 20. p. 356.

V. 1. I once *Bled* a Maſtive into a Curr, and the little Dog Bled out at leaſt double the Quantity of his own *Blood*, and left the Maſtive Dead upon the Table: and after he was unty'd, he ran away and ſhaked himſelf, as if he had been only thrown into Water.

The Transfuſion of the Blood *of a Calf into a Sheep by the* Veins *only; by Sir* Edm. King. *n. 25. p. 149.*

2. I took a Calf and a Sheep, both of the larger ſort, and having prepared a *Jugular Vein* in each, I planted my Pipes and Quills as is uſual, both in the *Jugular Vein* of the Calf (deſigned to be the *Emittent*) and in that of the Sheep (intended for the *Recipient*). Then I took out of the Sheep 49 *Ounces* (*Averdupois* Weight) of *Blood*, before any other *Blood* was let in; about which time the Company concluding the Sheep to be very Faint, and finding the *Blood* to run very ſlowly, I ſtopped the *Vein* of the Sheep, and unſtopped the Pipe in the Calf, letting run out 10 *Ounces* into a Porringer, which was done in about 40″ of a *Minute*. Then I conveyed Pipes from the *Emittent* Calf's *Vein* into the *Recipient* Sheep's *Vein*, and there ran a good free ſtream of *Blood* for the ſpace of 5 *Minutes* (though perhaps leſs ſwift than the firſt 10 *Ounces*.) And not to be deceived in the running, I did often ſtrike with my Finger the upper part of the *Emitting-Vein*, and thereby eaſily felt every ſtroke anſwer'd on the *Recipient-Vein*, juſt like a Pulſe. And now ſuppoſing that by this time, (*viz.* the lapſe of 5 *Min.*) the Sheep had receiv'd as much, if not more *Blood* than it had loſt; we ſtopp'd the Current of *Blood* from the Calf, and clos'd alſo the *Vein* of the Sheep; and then having unty'd her, and ſet her down in the Room, ſhe went about and appear'd to have as much Strength, as ſhe had before the loſs of her own *Blood*. Then reſolving to *Bleed* the Sheep to Death, we bound her the 2d time, and open'd the *Emittent* part of the *Vein* again; whereupon having *Bled* about 60 *Ounces*, ſhe fell into *Convulſions*; and after the loſs of about 5 *Ounces* more, ſhe Dy'd upon the place, And being Dreſs'd by the Butcher, there did not, in all the uſual places, appear above 3 *Ounces* of Blood; and the whole Sheep look'd of a lovely White.

We reſolv'd alſo to ſee the Calf bleed to Death: But he having *Bled* 10 *Ounces*, and then for the ſpace of 5 *Minutes* more into the Sheep and reſted a good while, the *Blood* by that time began to Coagulate in the *Vein*; which made me open the *Carotid Artery*, letting thence run out about 25 *Ounces* of *Blood*, of a very lovely and vivid Colour, vaſtly excelling therein the *Blood* of the *Vein*. The Calf, when Dreſs'd, had, by the Information

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of the Butcher, as little *Blood* as the Sheep; and we ſaw him look Whiter than uſually they do in the ordinary way of Killing.

2. I took out 45 *Ounces* and better, of *Blood*, out of the *Jugular Vein* of a Sheep, by which time we found her exceeding Faint. Then I convey'd *Blood* from the *Jugular-Vein* of a Calf into that of the Sheep, for the ſpace of 7 *Minutes*, when we did believe, by the continuance of a good ſtream from the Calf, that the Sheep had already receiv'd more *Blood* than ſhe had loſt. Whereupon we ſet her free and ſhe appear'd not at all concern'd at what ſhe had endur'd in the Experiment, and continu'd luſty and ſtrong. We then *Bled* the Calf to Death, and receiv'd from him 6 Porringers full of *Blood*, after the Sheep had been ſupply'd, each Porringer containing $11\frac{1}{4}$ *Ounces* of Water. The Sheep loſt 4 of the ſame Meaſures full of *Blood*; which being ſupply'd by that of the Calf, we reckon that the Calf loſt 10 ſuch Meaſures in all.

The Tranſfuſion of the Blood *of a Mangy into a Sound Dog*; *by Mr.* Tho. Coxe. n. 25. p. 451.

3. I procur'd an *Old* Mungrel Curr, all over-run with the *Mainge* of a middle Size, and having ſome Hours before fed him plentifully with Cheeſe-parings and Milk, I prepar'd the *Jugular Vein*, as we uſe to do the *Carotidal Artery* of the *Emittent* Animal. Then I made as ſtrong a Ligature upon the Dog's Neck as I durſt, for fear of Choaking him, to the end, that the *Venal Blood*, which is much more ſluggiſh in its Motion and Evacuation than the *Arterial*, might be *Emitted* with the greater Advantage of *Impetus*. Then I took a *young* Land-Spaniel, of about the ſame bigneſs, and prepar'd his *Jugular Vein*, as is uſually done in the *Recipient* Animal. Having thus prepared them both, and placed them in a convenient Poſture one to the other, I let ſlip the running Knots, and by frequent Compreſſion of the Neck (beſides the Ligature I had made) by reaſon of the tardy Running of the *Venal Blood* out of the *Emittent*, *Tranſfus'd* about 14 or 16 *Ounces* of the Blood of the *Infected*, into the Veins of the *Sound* Dog, as near as I could gueſs by the quantity of *Blood*, which ran into a Diſh from the *Recipient*; ſuppoſing the *Recipient* Animal to loſe near about the ſame Proportion to what the *Emittent* ſupplies.

The Effect of this *Experiment* was, no alteration at all, any way to be obſerv'd in the *Sound* Dog. But for the *Maingy* Dog he was in about 10 Days or a Fortnights ſpace perfectly *Cured*: Which might with probability enough, I think, have been expected from the conſiderable *Evacuation*, he made; perhaps the quickeſt and ſureſt Remedy for the *Cure* of that ſort of Diſeaſe he was Infected with, both in Man and Beaſt.

The Tranſfuſion *of the* Blood *of a Young into an Old Dog*; *by M.* Gayant, n. 26. p. 479.

4. Mr. *Gayant Tranſfus'd* the *Blood* of a *Young* Dog into the *Veins* of an *Old*, which two Hours after, did Leap and Friſk; whereas he was almoſt Blind with Age, and could hardly ſtir before.

The Tranſfuſion *of the* Blood *of Calves into Dogs*; *by M.* Denis. n. 25. p. 453.

5. Since the 9th of *March* 1667, we have *Tranſfus'd* the *Blood* of 3 Calves into 3 Dogs. After which the Dogs (all of them) did eat as well as before: And one of the 3 Dogs, from whom ſo much *Blood* had been drawn the Day before that he could hardly ſtir any more, having been ſupply'd the next Morning with the *Blood* of a Calf, recover'd inſtantly his Strength, and ſhew'd a ſurprizing Vigor.

6. Several

A very Plentiful Transfusion, *experimented upon a Bitch; by* ..... n. 28. p. 521.

6. Several successful Experiments have been made in *London*, of very Plentiful *Transfusions*; and among others (to mention a Signal one) that upon a *Bitch*, which lost in the Operation near 30 *Ounces* of Blood, and was recruited accordingly. This Animal does not only survive to this very Day, but had another more severe Experiment soon after try'd upon her, by which her *Spleen* was cut out, without tying up the Vessels, whence that Viscus was separated: Since which time she took Dog, (even before the *Wound* was heal'd up) was with Puppy, and brought forth Whelps, and remains well and jocund. So that it is not too hastily to be concluded, that large *Transfusions* are Dangerous.

The Transfusion *of the* Blood *of* 4 *Weathers into an Horse; by M.* Denys. n. 30. p. 559.

7. M. *Denys* writes from *Paris*, that they had lately *Transmitted* the *Blood* of 4 Weathers into a Horse of 26 Years old, and that this Horse had thence receiv'd much Strength, and more than an ordinary Stomach.

The Transfusion *of the* Blood *of one Lamb into another; by S.* ..... n. 42. p. 840.

8. *May* 8. 1677. at S. *Cassini*'s in *Bononia*, there was open'd the *Carotid Artery* of a Lamb, when the *Blood* was let run as long as it could, into the Right Branch of the *Jugular Vein* of another Lamb, from which there had before been drawn so much *Blood* as was judg'd it could be supply'd with from a Lamb of the like bigness, whose *Blood* should be let out till it Dy'd. After this, there were made two Ligatures pretty near to one another, in the *Vein* of the Lamb that had *Received* the *Blood*; and this *Vein* was quite cut thorow between the two Ligatures. This done, the Lamb was unty'd, and went about without any appearance of Feebleness; and its Wound being heal'd up, it grew like other Lambs. But the 5th of *Jan.* 1678, it Dy'd; and its *Stomach* was found full of *Corrupt Food*. Its Neck being Dissected, to see what had happen'd to the *Vein* Cut through, it was found, that it had joyn'd it self to the next Muscle by some Fibres, and that the upper part of that *Vein* had a Communication with the Lower, by the means of a little Branch, which might in some manner supply the Defects of the whole Trunck.

The Transfusion *of the* Blood *of a Lamb into a Spaniel; by* S. ..... n. 42. p. 841.

9. *May* 20. 1668. at S. *Griffoni's* at *Udine*, the *Blood* of a Lamb was *Transfus'd* into the *Veins* of a Spaniel of a middle Size of that Kind, 13 Years Old, who had been altogether Deaf for above 3 Years, so as what Noise soever was made, he gave not any sign of hearing it. He walked very little, and was so Feeble, that being unable to lift up his Feet, all he did was to trail his Body forward. After the *Transfusion* practised upon him, he remained for an Hour upon the Table, where he was yet unty'd; but afterwards Leaping down, he went to find his Masters that were in other Chambers. Two Days after he went abroad, and ran up and down the Streets with other Dogs, without trailing his Feet, as he did before. His Stomach also return'd to him, and he began to eat more, and more greedily than before. But that which is more surprizing, is, that from that time he gave signs, that he began to Hear, returning sometimes at the Voice of his Masters. The 13 of *June* he was almost quite Cured of his Deafness, and he appear'd without comparison more Jocund than he was before the *Operation*. At length, the 20th, of the same Month, he had wholly recover'd his Hearing; yet thus, that when he was call'd he turn'd back, as if he that had call'd him had been very far off. But that happen'd not always; in the mean time he heard always when he was call'd.

VI. I think, that a Silver Tube with a Silver Stopper, ſomewhat blunted at one end and flatted at the other for conveniency of handling, us'd already upon Beaſts with good Succeſs, is very proper for the *Tranſfuſion* of *Blood* into the *Veins* of *Men*. The Operation may be thus perform'd; After the *Artery* is prepar'd in a *Lamb*, *Kid*, &c. Let a Ligature be made upon the *Arm*, &c. of a *Man* (hard enough to render the *Vein* Turgid;) in the place you intend to inſert the leſſer end of the Silver Pipe, which is ſo fitted that the Silver Stopper, thruſt into the Tube, reaches ſomewhat, by its blunt end, beyond one of the ends of that Tube. This done, divide the Skin of the Part in the ſame manner that is us'd in Cutting an Iſſue, juſt over the *Vein* to be open'd. Then with a fine Lance open the *Vein*; or if you pleaſe, in caſe the *Vein* lie fair and high (eſpecially if the Skin be fine) you may open both together, according to the uſual way of *Letting Blood*. Which done, let an Aſſiſtant clap his Finger, or a little Boulſter prepar'd before-hand, or the like, upon the *Vein* a little below the Orifice, to hinder the *Blood* from Aſcending. Keeping that Poſition, inſert the blunt-ended Tube upwards into the *Vein*; when it is in, hold it and the Skin cloſe together between your Finger and Thumb. Then pull out of the Tube the Stopper, and inſert the Pipe by which the *Arterial Blood* is to be *Infus'd* from the *Emittent* Animal; managing the remainder according to the known Method of this Experiment.

A Method of Transfuſing Blood *into the* Veins *of* Men; *by Sir* Edm. King. *n.* 28. *p.* 522.

VII. The Experiment of *Tranſfuſing Blood* into an *Human Vein*, was perform'd upon Mr. *Arthur Coga*, *Nov.* 23. 1667. after this manner: Having prepared the *Carotid Artery* in a young Sheep, we made an Inciſion in the *Vein*, obſerving the Method above-mention'd, without any Alteration but in the ſhape of one of our Pipes; which we found more convenient for our purpoſe. And having Open'd the *Vein* in the *Man*'s Arm, with as much eaſe as in the common way of *Venæ-Section*, we let thence run out 6 or 7 *Ounces* of *Blood*. Then we planted our Silver Pipe into the ſaid Inciſion, and inſerted Quills between the two Pipes already advanc'd in the two Subjects, to convey the *Arterial Blood* from the Sheep into the *Vein* of the *Man*. The *Blood* ran freely into the *Man's Vein* for the ſpace of 2 Minutes at leaſt; ſo that we could feel a *Pulſe* in the ſaid *Vein* juſt beyond the end of the Silver Pipe. The *Patient* ſaid, he did not feel the *Blood Hot*, (as was reported of the Subject in the *French Experiment*) which may very well be imputed to the length of the Pipes, through which the *Blood* paſs'd, loſing thereby ſo much of the *Heat*, as to come in a Temper very agreeable to *Venal Blood*. That the *Blood* did run all the time of thoſe two *Minutes*, we conclude from thence. *Firſt*, Becauſe we felt a *Pulſe* during that time. *Secondly*, Becauſe when upon the *Man*'s ſaying, he thought he had enough, we drew the Pipe out of the *Vein*, the Sheep's *Blood* ran through it with a full ſtream; which it had not done, if there had been any ſtop before, in the ſpace of thoſe two *Minutes*; the *Blood* being ſo very apt to *Coagulate* in the Pipes upon the leaſt ſtop, eſpecially the Pipes being as long as 3 Quills. From the Quantity of Blood, which run

Tranſfuſion *Practiſed upon a* Man *in* London; *by Dr.* Richard Lower *and Sir* Edmund King. *n.* 30. *p.* 557. *Vid. Sup. Sect.* VI.

run through the Pipe into a Porringer, we judg'd that about 9 or 10 *Ounces* was receiv'd into the *Man's Veins*. The *Man* after the *Operation*, as well as in it, found himself *very Well*.

The effects of several Liquors mixt with the Blood, Warm from the Veins; by Mr. Rob. Boyl. n. 29 p. 551.

VIII. 1. In the Year 1664. I mention'd to the *Royal Society*, an odd Experiment I had formerly made upon *Blood* yet Warm, as it came from the Animal; *viz.* that by putting into it a little *Aquafortis*, or *Oyl* of *Vitriol*, or *Spirit* of *Salt*, (these being the most usual *Acid Menstruums*) the *Blood* not only would presently lose its pure Colour, and become of a dirty one, but in a trice be also *Coagulated*; whereas if some fine *Urinous Spirit*, abounding in *Volatile Salt*, such as the *Spirit* of *Sal Armoniack*, were mingled with the Warm *Blood*, it would not only not Curdle it, or imbase its Colour, but make it look rather more *Florid* than before, and both keep it *Fluid*, and preserve it from Putrefaction for a long time. This Experiment I devis'd, among other things, to shew the Amicableness of *Volatile Spirits* with the *Blood*.

By Mr. Oldenburg. ib.

This Experiment was publickly related by Mr. *Boyle* to the *R. Society* in *Dec.* 1664. as appears by their *Journals*.

Liquor injected into the Veins of Dogs; by S. Fracassati. n. 27. p. 490.

Aqua-fortis.

IX. 1. S. *Fracassati* Professor of *Anatomy* at *Pisa* in *Italy*, having *Infus'd* into the *Jugular* and *Crural Vein* of a Dog some *Aquafortis* Diluted, the Animal dy'd presently; and being open'd all the *Blood* in the Vessels was *Fixed*, but that in the Guts not so well. It was also observ'd, that the great Vessels were Burst, perhaps by an Effort of Nature; even, as in the greatest part of those that Dye of an *Apoplexy*, the Vessels of the *Lungs* are found Broken. Upon which Experiment, the Author maketh these Reflections: *First*, That an *Apoplexy* being often caused by a like *Coagulation* of the *Blood* (as hath been observ'd by the opening, made of sundry Persons, who Dy'd of that Distemper) it might be Cured by a timely *Infusing* some *Dissolvent* into the *Veins*. *Secondly*, That it is likely, that that useful Secret, by which M. *de Bills* Dissected Animals without any *Effusion* of *Blood*, consists in some such *Infusion*.

Spirit of Vitriol.

2. There was afterwards *Infus'd* into another Dog some *Spirit* of *Vitriol*, which had not so present an Effect; for the Animal complain'd a great while, and Foam'd like *Epileptick*s, and had its *Respiration* very thick; and observing the beating of his Breast, one might easily judge, the Dog suffer'd much: who Dying at last, his *Blood* was found *Fixed* in the *Veins*, and Grumous, resembling Soot.

Oyl of Sulphur.

3. Then there was *Injected* into a Dog some *Oyl* of *Sulphur*: But he Dy'd not of it, though this *Infusion* was several times try'd upon him. And the Wound being Clos'd, and the Dog let go, he went into all the Corners of the Room searching for Meat, and having found some Bones, he fell a Gnawing of them with a strange Avidity, as if this *Liquor* had caus'd in him a great *Appetite*.

Oyl of Tartar.

4. Another Dog, into whose *Veins* some *Oyl* of *Tartar* was *Injected*, did not escape so well: For he complain'd much, and was altogether Swoln, and then Dy'd. Being open'd, the Spectators were surpriz'd to find his *Blood* not Curdled

Curdled, but on the contrary more *Thin* and *Florid* than ordinary; which ſeems to hint, that too great *Fluidity* of the *Blood*, as well as its *Coagulation*, may cauſe Death.

Mercury Injected *into the* Veins *of Dogs*; *by Dr.* A. Moulin. n. 192. p. 486.

X. 1. In *Autumn* 1690. I *Injected* into the *Jugular Vein* of a Dog, about ½ an *Ounce* of Crude *Mercury*, and obſerv'd the Dog ſoon after to have a dry ſhort *Cough*, which by pretty intervals ſeiz'd him. About 2 Days after I found him troubled with a great difficulty of *Breathing*, and making a Noiſe like that of a *Broken-winded* Horſe; there was no Tumor about the Root of his Tongue, nor any Swelling in the *Maxillary* or *Parotide Glandules*, neither was he obſerv'd to Drivle, though I order'd him warm Broth in Expectation of a *Salivation*. The 4th Day after the *Injection* of the *Mercury* he Dy'd, being for the 2 Days before ſo troubled with an *Orthopnæa*, that he could Sleep only when he lean'd his Head againſt ſomething. I open'd him, and found about a Pint of *Bloody Serum* Extravaſated in the *Thorax*. I found alſo the outſide of the *Lungs* in moſt places *Bliſtered*; (for what I at firſt took to be ſome Preternatural Dilatations of the *Veſiculæ* of the *Bronchiæ*, were only *Bliſters* or a ſeparation of the common Integuments of the *Lungs* from their Subſtance;) ſome of theſe were larger than a Rouncival-Pea, others were ſmaller; but moſt of them contain'd *Mercurial* Globules, to be ſeen, even without opening, in ſeveral of them, thro' the outward Skin. Several of them I found broken, and upon a little Preſſure obſerv'd the *Mercury* to run out, and with it a little *Sanies*; but upon a pretty ſtrong Preſſure, I obſerv'd that a great quantity of that *Sanies* iſſu'd out. When I open'd the Right *Ventricle* of the *Heart*, I found ſome Particles of the *Quick-ſilver* in the very midſt of the *Coagulated Blood* lodg'd there: And in that alſo, contain'd in the *Arteria Pulmonalis*. I obſerv'd moreover *Blood*, *Coagulated* after a very different manner (which I want words to expreſs) from what I have ſeen at any other time, notwithſtanding the various Methods I had uſed to *Coagulate* it, and this in the Interſtices between the *Columnæ* of the aforeſaid *Ventricle*; and in this a greater quantity of *Quick-ſilver* than any where elſe in the Dog. This *Coagulum* was in the *Vertex* of the *Ventricle*, adhering pretty cloſely to the *Columnæ* and *Parietes*. Opening the Left *Ventricle*, I found a very tenacious *Blood*, *Coagulated* and ſticking firmly to the great *Valve*, including the Tendons of it, and a little reſembling a *Polypus*. In this *Ventricle* I ſearched diligently for *Mercury*, but found none; whence it may appear, that the *Mercury* paſs'd no farther than the Extremities of the *Arteria Pulmonalis*. This occaſion'd the aforeſaid *Bliſters*, and forced its way through the common Coat of the *Lungs*. I alſo open'd the *Aſpera Arteria* down to the very *Bronchiæ*, but could find no *Mercury* in it, though I ſearch'd diligently for it. Each of the Subdiviſions, as well as Diviſions, of the *Bronchiæ* was fill'd with a *Sanies*, which when I waſh'd away, I found Globules of *Mercury* in many places under the *Bronchiæ*, and upon Examination they prov'd to be in the *Arteria Pulmonalis*, I have preſs'd theſe Globules backwards and forwards, and made ſome of them get out at the holes made in the *Veſiculæ* or *Bliſters* above deſcrib'd.

From hence may appear the danger of using *Mercury* in Human Bodies, so as that it may get into the *Mass* of *Blood*, especially into the *Lungs*; they wanting that brisk strong Motion which the Muscles have in other Parts, which are able to force it along with the *Blood*, in order to the raising a *Salivation*. Their Lax Spongy Texture makes them extreamly unfit for clearing themselves of so troublesome a Guest as *Mercury* is. That it has this Effect on Human *Lungs*, is plain from what we daily see in Persons that have been often *Fluxed*, who are afterwards observ'd to Dye of *Consumptions* that will not give way to *Medicine*.

By Dr. Chr. Pitt. n. 240. p. 184.

2. Dissecting a Chance Dog, that had *Mercury Injected* into one of the *Jugulars*, (but how long it had been in his Body I cannot tell) I found it thrown out of the *Blood* into the *Cavity* of the *Abdomen*, as likewise some appearance of it in the other *Cavities* of the Body. All the *Glandules* were very Turgid and full of Liquor, especially in the *Ventricles* of the *Brain*, and all round there was a great Quantity of *Serum*. This may be call'd a true *Hydrocephalos*.

Medicated *Liquors* Injected *into* Humane Veins; *by Dr.* Fabritius. n. 30. p. 564.

XI. 1. We have *Injected*, by a Syphon, about 2 *Dr.* of a *Laxative* Medicine into the *Median* Vein of the Right Arm of 3 Patients in the *Hospital* at *Dantzick*. One of the Patients was a Lusty Robust Soldier dangerously Infected with the *Venereal Disease*, and suffering grievous Protuberatings of the Bones in his Arms. He, when the *Purgative* Liquor was *Infus'd* into him, complain'd of great Pains in his Elbows, and the little *Valves* of his Arms did swell so visibly, that it was necessary by a gentle Compression of one's Finger to stroke up that Swelling towards the Patient's Shoulders. Some 4 Hours after, it began to work, not very troublesomely, and so it did the next Day, insomuch that the Man had 5 good *Stools* after it. Without any other Remedies those Protuberances were gone, nor are there any Footsteps left of the above-mention'd Disease.

The two other Tryals were made upon the other Sex. A Marry'd Woman of 35, and a Serving-maid of 20 Years of Age, had been both of them from their Birth very grievously afflicted with *Epileptick* Fits, so that there was little hopes left to Cure them. They both underwent this *Operation*, and there was *Injected* into their *Veins* a *Laxative Rosin*, Dissolved in an *Anti-Epileptical* Spirit. The *first* of these had gentle *Stools* some Hours after the *Injection*, and the next Day; the Fits, recurring now and then, but much milder, are since altogether vanish'd. As for the other, *viz.* the Maid, she went the same Day to *Stool* 4 times, and several times the next; but by going into the Air, and taking Cold, and not observing any Diet, cast her self away.

'Tis remarkable, that it was common to all three to *Vomit* soon after the *Injection*, and that extreamly and frequently.

Medicines Injected *into* Humane Veins; *by*..... n. 39. p. 766.

2. M. *Smith*, hath adventured to open a Vein and *Infuse* some *Medicines* into the *Blood* of two Persons in the *Hospital* at *Dantzick*, desperately Infected with the *Pox*; whereof the one Recover'd, and the other Dy'd. Afterwards (*viz. Jul.* 1668.) the same Physician together with M. *Scheffe-*

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ler repeated the Experiment, by *Infuſing Altering* Medicines into the *Veins* of the Right Arms of 3 Perſons. The one Lame of the *Gout*, the other extreamly *Apoplectical*; and the 3d, reduc'd to Extremity by that Odd Diſtemper, the *Plica Polonica*. The ſucceſs of this, as M. *Hevelius* (who was the only Perſon admitted to be preſent at the *Operation*) informs me, was, That the *Gouty* Man found himſelf pretty well next Day, and ſhortly after went to Work, it being Harveſt-time, and has continu'd well ever ſince, leaving the *Hoſpital Aug.* 17. 1668, and profeſſing himſelf Cur'd: The *Apoplectical* hath not had one *Paroxyſme* ſince; and the ſeveral Sores which the *Plica Polonica* had occaſion'd, are Healed, and both theſe Perſons are able to Work.

XII. It is commonly obſerv'd, that when any *Blood* is become *Cold* in a Diſh, that part which is beneath the Superficies appears much Blacker, than that on the Top. S. *Fracaſſati* maintains, that this Blackiſh Colour comes from hence, that the *Blood*, which is underneath, is not expos'd to the *Air*, and not (as it is vulgarly ſuppos'd) from any Mixture of *Melancholy*. To prove which, he aſſures, that upon its being expos'd to the *Air*, it changes Colour and becomes of a *Florid Red*.

An Obſervation upon Blood *grown* Cold; *by* S. Fracaſſati. n. 27. P. 492.

XIII. Take a Quantity of *Filings* of *Copper*, freſh made, and place them in a Glaſs Vial, whoſe Bottom is broad and even, and then pour on an *Urinous Spirit*, either of *Sal Armoniack*, or of *Urine* it ſelf, not made with *Quick-Lime*. 1. The Glaſs ſhould not be fill'd up much above one half-way, and then muſt preſently be ſo exactly ſtop'd that no *Air* be capable of intruding. You may then obſerve for 4, 5, or 6 Days the *Tincture* will be growing Deeper and Deeper, and then will keep a ſtand for 2 or 3 Days, more or leſs, and afterwards will gradually decline until it become quite Pale, and void of all Colour, When it is in this ſtate, the eaſieſt way of performing the *Experiment* for your own ſatisfaction, is to decant this *Clear* Spirit into a Glaſs ſo as to leave all the *Filings* behind, and that will demonſtrate that the *Filings* did not give this *Tincture de novo*, but that it belongs to the Influence of the *Air*. But in caſe you are furniſh'd with an *Air-pump*, and can pour off this *Pallid* Liquor in a *Vacuo Aeris*, and there ſtop it up ſecurely, you may then preſerve it ſo long as you pleaſe, and exhibit it to advantage. You may alſo obſerve, that ſo ſoon as you let in the *Air*, the upper Superficies immediately *Tinges* firſt, and ſo Deſcends deeper and deeper until it has penetrated the whole, and this it does the ſooner, if the Glaſs be wide, and the Liquor by conſequence have a large Superficies: Or if you pour it out of one Glaſs into another, the *Air* makes a more ſudden *Change* of the whole.

Some Effects of the Air *upon* Blood, *Explain'd by an Experiment of the* Change *of* Colour *in a clear Liquor upon the Admiſſion of* Air; *by Dr.* Fred. Slare. n. 204. p. 898

That this Liquor ſhould loſe its *Tincture* is not to be wonder'd at, for even Ink it ſelf by ſtanding ſtill will loſe much of its Tincture; and ſo do the *Tinctures* of many Minerals: Nor can we expect that there ſhould be any *Precipitation* diſcernable at the bottom of the Glaſs, if we conſider, that 2 Gr. of *Copper* will give a Deep Colour to 3 *Ounces* of *Urinous*

Spirit. But this is ſurpriſing, that ſince our *Menſtruum* (that is our *Spirit*) is diveſted of its *Venereal Particles* which gave the *Tincture*, and is become as *Clear* as Rock-water, and being ſeparated from its Metalline *Filings*, does yet upon the approach of the *Air* immediately afford a very *Blue Tincture*. This indeed plainly ſhews, that there muſt be conceal'd in the Pores of the Liquor, ſuch Particles as are of a *Cupreous* Nature. But how may this come to paſs? To which I anſwer, I cannot be ſo vain to think, that the *Air* gives the Matter of the *Colour* to the *Spirit*, but that it conveys into it ſuch Particles as do Stimulate and give Motion to the *Menſtruum*, and inable it to Diſſolve thoſe Particles thoroughly, that for want of more *Air* had not been fully broken in pieces.

In the next place, I diſcover two very differing ſorts of Matter that our *Urinous Menſtruum* acts upon in this *Experiment*. One I call a *Sulphureous* Matter, which gives the *Blue* Colour, and does let it fall again; and another which deſerves the Name of *Saline*: but though it be taken up into our *Tinging* Spirit, does yet notwithſtanding afford no *Tincture* whilſt ſecluded from the *Air*. This was made to me very plain and clear, for having found out a way to ſeparate a White Slimy Subſtance out of our clear Liquor, I then Deſtroy'd the *Experiment*, ſo that when expos'd to the *Air* the *Menſtruum* would no more give the leaſt *Tincture*. For a farther Confirmation, this White *Saline* Subſtance being in a ſmall quantity Diſſolv'd into any proper *Urinary Menſtruum*, exhibits the *Experiment* ſet down to advantage, and gives a much Finer and Brighter Colour than what is drawn from *Crude Copper*, or from the *Sulphureous* parts.

The great Intereſt the *Air* has in this *Experiment*, made me think of applying it to the great *Change* that is made upon *Blood*: For it is obvious to every Body, that there is a great difference in Colour betwixt the *Venal* and *Arterial Blood*; the *Venal* as ſoon as it is let out of the *Vein* is obſerv'd to be of a dark Complexion, and requires ſome time to be expos'd to the *Air* before it obtains a *Florid Red*, and that only Superficies which is contiguous to the *Air*, does for a good while become *Red*; for I have turn'd up a Cake of *Blood* 24 Hours after it had been let out, and found it of a very Dark and Opake Colour, but the *Air* has immediately given it a Bright and Florid *Red* Tincture. This ſo manifeſt a *Change*, made by Virtue of the *Air*, is contrary to the Opinion of thoſe Anatomiſts, who would have *Reſpiration* to be chiefly to promote the *Circulation* of the *Blood*, and that great *Apparatus* of *Air-Veſſels* to be for a Fan to *Cool* the Maſs of *Blood*, and that the *Air* returns unalter'd, and not capable of making any great Alteration, being deny'd any Ingreſs into or Mixture with the *Blood*. But the Obſervation is certain and unerring, that the *Venal Blood* as it paſſes the Right *Ventricle*, at its entrance into the *Lungs*, is of a very Opake and Blackiſh Complexion, and in its paſſage through the *Lungs*, before it comes to the Left *Auricle*, is *Changed* into a very Florid and Bright *Red*. And I have often obſerv'd that Perſons that have Vomited *Blood*, upon a Rupture of ſome Capillary Veſſels of the *Lungs*, have ſent up a very *Froathy* or Spumous *Blood*, and at the ſame time of a bright Scarlet *Red*: That it was Froathy, argues that the *Air* had

had incorporated with it; that it was *Red*, was due to the Tinging Powe(of the *Air*. To expect that this *Change* ſhould be made in the *Heart* by any Local Ferment, or *Flamma Vitalis* is fruitleſs; becauſe we find it perform'd before its arrival there; the Structure of the *Heart* denoting that Engine to be principally made for Projecting the *Blood*, in order to a *Circulation* through thoſe various *Arteries*, or Pipes, which are branched from the *Heart*. Let us therefore examine the Structure of the *Lungs*, and we ſhall ſoon diſcover it to be a *Pneumatick* Engine made principally for taking in *Air*, and that in great Quantities. It's true, we may call the *Lungs* a Contexture of *Veins*, *Arteries*, *Nerves*, *Lymphæ-ducts*, &c. and that theſe do very much make up the *Parenchyma* (as ſome do uſe the word) of the *Lungs*; but yet we ſhall find the great bulk of the *Lungs* to be *Veſicular*: It ſeems to me to be a Continuation of the *Aſpera Arteria*, or Wind-pipe, divided and ſubdivided into many Branches, and theſe ſtill ſpun out into leſſer and leſſer Pipes, all of them Hollow; the farther they Run the Thinner their Sides do grow, which upon the *Inſpiration* of the *Air* do Swell up and grow Round, and upon *Expiration* do fall ſomething Flaccid, and abate ſomething of that Figure, as the Microſcope does plainly repreſent.

It is therefore more than probable, that the *Air* ſhould inſinuate it ſelf into this Machine which is ſo truly adapted to receive it, and that in great Quantity; for in each *Inſpiration* the *Lungs* are ſtretch'd at that rate, as to take up double the Room they do in the State of *Expiration*, or in their Compreſſed State; and even in this State the *Air-Bladders* are not fully Evacuated, but contain *Air* for good purpoſes. Nor can it be pretended, that any Augmentation is due to the *Expanſion* of the *Blood-Veſſels*, or any other which do not Swell beyond their uſual Tenſion in each *Inſpiration*. The *Sanguiferous-Veſſels* are divaricated through all the *Lobes* of the *Lungs*, and do give a very cloſe attendance to each *Veſicula* (for there is not the leaſt *Veſicula* but has a Capillary Veſſel which intimately inſinuates into it) in order to receive ſome conſiderable Benefit from it; and this appears to the Eye; for in an Inſtant a dark and foul Blood is *Changed* into a Bright Florid *Red* Colour. Nor is the *Air* thus Infus'd into the *Lungs* for a bare Colour, and of no farther conſideration: But I am apt to believe the great *Fermentations* of the *Blood* the Cauſe of the *Motions* and Actions of the *Muſcles*; the *Animal Spirits* themſelves, the great Spring of *Motions*, deriving their Energy and Powers, if not Nature, from hence. But *Corollary*. 1. That the *Air* is full of *Volatile Salts*, none will deny; but that theſe *Salts* muſt bear the Name of *Nitrous Salts*, is called in Queſtion by this, and ſome other Experiments I have made. *Nitrous Salts* ſeem to me not to have any property of *Volatile Salt*. *Nitre* is a Salt of ſo *Fix'd* a Nature, that it will continue melted in a very ſtrong Fire, with ſcarce any Evaporation; but if you put into it Charcoal or Brimſtone, or give it an Accenſion, by another *Encheireſis* you may obtain a great Quantity of as *Fix'd* a *Salt* as any Concrete whatever affords; ſo that to me Gold ſeems not of a more Fix'd Nature.

Corol. II. A Standard of *Volatile Salts* ſhould be ſettled, at preſent I can think of none better than *Water*: That *Salt* which in *Diſtillation* is more

Fix'd

Fix'd than *Water*, ought not to be reckon'd among *Volatile Salts*. This Standard will be juſtify'd by good Meaſures, grounded on Experience: For all *Salts* that are truly *Volatile*, as far as I could obſerve, are really *Lighter* than Water, that is, in a *Chymical* Senſe, do with a leſs Degree of Fire *Sublime* in our Glaſſes, or come over the *Helm*, than *Water* does, This I find juſtify'd in our *Volatile Salt* of *Amber*, erroneouſly ſo call'd, for it does not come up to our Standard of *Volatility*, and is really no *Volatile Salt*; as will be made appear: If you take this ſuppos'd *Volatile Salt*, and *Diſtill* it in a *Retort*, or Head and Body, with common *Water*, the *Water* will Aſcend in ſuch a Degree of Fire where the *Salt* will not, for you muſt increaſe your Fire conſiderably to make it Riſe after the *Water* is gone, and has left the Dry *Salt* at the Bottom. This made me enquire farther into the Properties of this *Salt*, which did not at all correſpond with *Volatile Salts*, (for all true *Volatile Salts* are *Alkalies*) but on the contrary would Ferment with them, and quite deſtroy the property of true *Volatile Salt*, by bringing them to a dull Inſipid *Salt*, which ſome call *Sal Neutrum*; and alſo by Fixing their *Volatile* Nature, not only in putting them by the Standard of *Volatility*, but alſo does quite deſtroy their *Spiritous* and Stimulating Smell, by Virtue of which they have been always deſervedly eſteem'd ſuch Excellent *Cephalick* Medicines. Therefore examining this *Salt* yet a little farther, you will plainly prove it to be an *Acid*, that Corrodes *Iron*, turns Syrup of *July-flowers* Green, deſtroys the Tincture of *Lignum Nephriticum*, and does not Ferment with common *Acids*; ſo that it plainly belongs to the Tribe of *Acids*, and ſhould be ſtruck out of the Catalogue of *Volatile Salts*; and perhaps, out of the Number of *Specifick Cephalicks*, and rather to be degraded amongſt the *Diureticks*, and even in that Rank to have but an inferior Station; for it ſeems to me to be but a Dull Medicine, and more valuable for its Price than great Vertue, eſpecially if quite Diveſted of all its *Oyl*, in which the great *Cephalick* and *Cordial* Vertues muſt needs be own'd to conſiſt.

Corol. III. That *Volatile Salts* have a great Property to draw *Tinctures*, and do particularly advance thoſe Colours that are diſpos'd to be *Red*: For tho' the *Spirit* of *Wine* be a very *Catholic Menſtruum*, and draws a very deep *Tincture* of *Cochineel*, yet we have often obſerv'd, that if we put to this *Tincture*, when higheſt, a ſmall proportion of *Volatile-Salt*, that would advance it to a great, even a double Degree. Thus I have obſerv'd it to advance the *Tincture* of *Arterial Blood*, and which is very Curious, if you Diſſolve it in your *Blood* whilſt you are Bleeding at one of your Veins, that *Blood* will become very *Florid*, and like *Arterial Blood*. Therefore ſince *Nitrous-Salts* produce none of theſe *Tinging* Effects; this *Corollary* ſeems much to favour the Notion, that the Effects of the *Air* upon the *Blood*, may be due to ſuch *Salts* as are of a *Volatile-Alkaliſat* Nature.

Corol. IV. *Contagious* Diſeaſes are Communicated by the *Air* Inſpired at the *Lungs*; and this ſeems more probable, than what Dr. *Needham* and others have endeavour'd to make out, with more Difficulty, in attributing the ſame Effect to the *Air* taken in our Meat by *Maſtication*, and ſwallow'd down

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in our Drink and communicated to our *Chyle*, from thence to our *Blood* and *Spirits*. But this way a very ſmall Quantity of *Infected Air* is Communicated, if we compare it with what is Communicated to the *Lungs*: For in each *Inſpiration*, Human *Lungs* of an ordinary Size do at leaſt take in ſuch a Quantity of *Air*, as will fill up a Quart Bottle, and in the ſpace of a *Minute* I have made 12 *Reſpirations*, (when I was very ſedate, and drew in my Breath very treatably) and in that time by conſequence took in as much *Air*, as would fill up a Veſſel capacious enough to hold 3 *Gallons* of Water; and its plain, that the *Air Expir'd* returns much alter'd, foraſmuch as the *Breath* or *Halitus* returns *Impregnated* with a moiſt Vapour, and ſuch a one as does many times indicate the Temper of the *Blood*. From this *Halitus* Impoſtumations of the *Lungs* are frequently predicted: Such as have *Sulphureous Blood* ſhall Emit no very pleaſing but Rancid Exhalations. Nor does the *Blood* only clear it ſelf of ſome Vapours in *Expiration*, but alſo Imbibe and Impregnate itſelf with ſuch Particles as are neceſſary to maintain *Life* in *Inſpiration*: For a Man could not ſubſiſt long in a Tun of *Air*, ſhould he be kept cloſe in ſo capacious a Veſſel; as we have found by Experiments made with ſeveral *Reſpiring* Animals, Dogs, Cats, and Birds, *&c.* that theſe would ſoon Dye there; ſo that we need conſtant ſupplies of vaſt Quantities of Freſh *Air*, which makes me believe that thoſe Particles ſeparated out of the *Air* by the *Lungs* are very ſparingly deliver'd or mix'd with the common *Air*, but yet with this Difference, that the more Compreſs'd the *Air* is, the more it contains of that *Vivifying Salt* or *Spirit*; and on the contrary, the more Rarify'd, the leſs is found: For we are told by the Experience of ſuch as have been on the *Pike* of *Teneriff*, that their Breathing is more difficult there, than at the Bottom where the *Air* is more Compreſſed. And we have found Birds and Mice, *&c.* would *Live* as long again in a Veſſel where we had crouded in, by a Syringe, (or any other Condenſing Engine,) a double Quantity of *Air*, as they did where they were confin'd only to common *Air*. To conclude, ſince the *Vivifying* Particles in the *Air* ſeem to be very ſparingly Diſſeminated through it, I am apt to believe, that the Noxious and *Peſtilential* are more Sparingly ſcatter'd up and down (the Author of Human Nature having taken more care for its Preſervation than for its Deſtruction;) and therefore it may much better be infer'd from the Premiſes, That *Contagious Diſeaſes* muſt needs be Communicated to the *Blood* by *Inſpiration* into the *Lungs*, rather than any other way.

XIV. 1. A Curious Perſon writes from *Paris*, that there they had, in the Houſe of a Phyſician, newly open'd a Man's *Vein*, wherein they found *Milk* inſtead of *Blood*. *White* Blood; *by M.* ..... n. 6. p. 100.

2. A Maid, after eating a good Breakfaſt about 7 in the Morning, was let *Blood* about 11 the ſame Day in her Foot; the firſt *Blood* was receiv'd in a Porringer, and within a little while it turn'd very *White*; the laſt *Blood* we receiv'd in a Sawcer, which turn'd *White* immediately, like the White of a Cuſtard. Within 5 or 6 Hours after I chanced to ſee both, and that in the Porringer was half *Blood* and half *Chyle*, ſwimming upon it like a *Serum* *By Dr. Lower, ib. p. 117.*

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as *White* as Milk, and that in the Sawcer all *Chyle* without the leaſt appearance of a Drop of *Blood*; and when we heated them diſtinctly over a gentle Fire, they both Harden'd, as the White of an Egg when 'tis heated, or juſt as the *Serum* of *Blood* doth with heating, but far more *White*. This Maid was then in good Health, and only let *Blood* becauſe ſhe never had her *Courſes*, yet of a very *Florid* Clear Complexion.

By Dr. If. Beal. n. 8. p. 139.

3. About 20 Years ago Mr. *Tho. Day*, (an Apothecary in *Cambridge*) told me, That himſelf let a Man *Blood* in the Arm, and the *Blood* was as *White* as Milk; as it run out of his Arm, it had a little dilute *Redneſs*, but as it fell into the Veſſel it was preſently *White*; and it continu'd like Drops of Milk on the Pavement, wherever it fell. The Conjecture which Dr. *Eade*, a Phyſician there, had of this appearance, was, that the Patient had much Fed on *Fiſh*; affirming withal, that he had ſoon been a *Leper*, if not prevented by *Phyſick*.

The Conſtituent *Parts of* Humane Blood; *by Dr.* Raym. Vieuſſins. n. 241. p. 224.

XV. 1. Cum mihi *Rex*, ob edita in Lucem Opera quædam Medica, Penſionem Annuam Librarum mille ad Vitam liberaliter conceſſiſſet, ne Principis omnium Maximi Favore atque Gratia indignus videri poſſem, ſtatim me totum contuli ad amplam accuratamque Morborum Internorum Hiſtoriam contexendam. In ipſo vero Limine hujus Operis, eſtatuendum atque clare demonſtrandum duxi, quæ ſit Eſſentia, quæ Vis eorum Corporum quibus *Sanguis* conſtat, tum, quod majus eſt, quæ tandem inter illa reperiatur proportio quantitatis, In *Sanguine* igitur contemplando curas omnes meas defixi, & Cl. *Boylæi* nunquam ſatis laudandi Veſtigiis in hoc Suſcepto meo inſiſtendo, & ulterius quam ille progredi, ſi poſſem, conando quod diu multumque optaveram, vixque ſperare auſus eram, id tandem, quamvis non ſine gravibus longiſque Laboribus, conſecutus ſum. Quò jam *Chymici*, *Medicique* illi (abſit verbo invidia) prorſus Erraſſe mihi videntur, qui illud quod è *Sanguine Sal* elici ſolet, merum *Sal Acre* ſeu *Alkalinum* eſſe, nullâque Induſtriâ verum *Sal Acidum* ex illo educi poſſe, hactenus crediderunt. Ii pariter tum *Chymici* tum *Medici* erravere, qui eam, quam à Natura partes Vivifici hujuſmodi Liquoris inter ſe habent, proportionem Quantitatis, nullâ reperiri poſſe Arte ab elapſis tot Seculis judicaverunt.

Equidem Scio, & fateor, *Sal* ſive *Volatile*, ſive *Fixum*, Ignis vi extractum è *Sanguine*, Fermentationem, quod aiunt, cum Fluoribus quibus vis *Acidis* etiam mitioribus pati: præterea id ipſum *Sal Sublimatum Corroſivum* diſſolutum præcipitat, & Syrupum Violaceum Viridem facit, ut nemo neſcit, adeoque multas *Salino-acres*, ſeu *Alkalinas* habet particulas, quibus hæc præſtat; ſed *Salinas* quoque *Acidas* non paucas complectitur, ut adducendis modo in medium Experimentis conſtabit certo certiùs. Quamobrem illud eſſe à Natura ſua verum Corpus *Salſum*, exploratum deinceps omnibus erit, ac cognitum, nec non extra omnem omnino Contraverſiam poſitum. Corpus *Salſum*, cum dico, conflatum intelligo ex partibus quidem *Salino-Acribus* & *Salino-Acidis*, ſed *Salino-Acribus* longe pluribus ex quo illud conſequens eſt, ut integrâ inviolatâque Naturâ, *Salino Acidæ* majore *Salino Acrium* copiâ atæ, & quaſi Sepultæ deliteſcant.

Cum

Cum *Sal Acidum*, ſub forma ſcilicet *Spiritus Acidi*, eruere vellem, ſi fortè poſſem, è *ſalſo Sanguine*, quod jam diu in Innatum & Adventitium, ſeu ab Alimentis potiſſimùm ſuppeditatum, diviſi; Libras 50. ejuſmodi Liquoris, prius Æneo in Vaſe Ignis vi, quantum par erat, exſiccati, per totàs 24. horas in Fornace Figuli torrui, ſeu, ut aiunt, Calcinavi; adeoque illas ad tres *Uncias* & *Drachmas* 7 Cineris Griſacei redegi: Ex hoc Cinere, Guſtui valdè Aſpero, cum *Spiritibus Acidis* fermenteſcente, & Tincturæ Florum Malvæ Viridem Colorem inducente *Lixivium* confeci, ex quo *Unciam* unam *Salis Fixi* candoris penè Nivei, eduxi: *Salis* illius, quod, ut ſupradictum eſt, cum omnibus *Spiritibus Acidis* Fermenteſcebat, Sublimatum Corroſivum diſſolutum præceps agebat, & Syrupum Violaceum colore Viridi tingebat, 7 *Drachmas* & 42 *Grana* 3 circiter *Unciis* Boli ſicciſſimi admiſcui: Ex mixto hujuſmodi *Retortâ* Luto munitâ incluſo Igne, aiunt, *Reverberii* extraxi *Semiunciam* & *Grana* 18 *Spiritus*, colorem *Spiritus Sulphurei* quodammodò imitantis, & ipſo Spiritu *Aceti* Acidioris Linguæ Judicio.

Spiritus ille plurimum Fermentatur, non ſolum cum Oleo & *Sale Fixo Tartari*, verùm etiam cum *Sale*, ſive *Fixo*, ſive *Volatili*, & ſubrufo *Spiritu*, quæ Ignis vi extrahuntur è *Sanguine*. Præterea ipſemet *Spiritus* Rubefacit Syrupum Violarum, Tincturam Heliotropii, & Florum Malvæ. Quare Liquidò conſtat *Sal* ex *Sanguine Humano* extractum, debere credi verum *Salſum*; id eſt *Salſum* ac quoddam *Acre Acidum*. Quod omnia inter *Salſa* perfectam cum ſolo *Sale Fixo Tartari*, en nullam cum *Sale Marino*, ſive odore ſive Sapore, ſive Dentium ſtupefaciendorum vi, ſive aliis quibuſvis Effectibus ſuis, Similitudinem habere videtur ut experientia demonſtrat. Unde patet ulteriùs Extractionem *Salis Acidi* ex eodem *Sanguine*, difficilem adeò hactenus ab omnibus Exiſtimatam, reipſa fieri, ſi docta peritaque manus non deſit.

Extracto & quaſi per vim avulſo *Spiritu* illo, de quo jam dixi, ex intimis Viſceribus *Salis Fixi*, ubi concluſum penituſque obrutum latitabat, ſub forma Solidi quidem Corporis, ſed tamen in partes exiguiſſimas diviſi, confectum eſt à me *Lixivium* è reſiduâ in fundo Vaſis Materiâ, ex quo binæ *Drachmæ* cum dimidia & *Grano* uno *Salis Fixi* Griſacei ſubalbeſcentis eductæ fuere: Iſtud *Sal* cum nullo liquido *Acido*, ſaltem ad ſenſum Fermenteſcebat, ſi *Oleum Vitrioli* excipiatis; id tamen ut *Sal Acre*, ſive *Alkalinum* purum, aut fere purum, ſpectandum eſt; quoniam ad id, quod jam particulas ſuas *Salino Acidas* omnes, vel ferme omnes, depoſuit, accedit iſtud præterea, quod Syrupo Violaceo priûs nonnihil excalefacto, & Tincturæ Florum Malvæ Viridem tribuit Colorem, *Sublimatum Corroſivum* diſſolutum præcipitat, & cum *Oleo Tartari* nullo modo Fermentatur. Adde quòd nec vel tantillum immutat colorem Tincturæ Heliotropii, quam tamen *Acida* omnia, cum ſolida tum liquida, Rubefaciunt.

Quodam elapſo tempore, poſtquam è *Fixo Sanguinis Humani Sale Spiritum Acidum* elicuiſſem, Viridis recordatus ſum Coloris, quem aſſumpſerunt ultimæ Guttæ *Spiritus* Subrufi hujuſmodi Liquoris, cum illum à duobus jam elapſis Annis ex Alembico Æneo diſtillarem. Viridis autem, planeque Porraceus Color Guttarum illarum Subrufi *Spiritus Sanguinis*, meâ quidem Sententiâ, ſuam ducebat Originem è quibuſdam *Vitrioli* particulis *Salino Acidis* Ignea vi

ex Ære Alembici, avulsis, & ipsis intimè admistis: Cum primum recordatio hujusce Coloris animum subrepsisset, hæc non levem mihi peperit anxietatem; quoniam per hunc Casum, quem verissimum etiam atque etiam Testor, vix dubitare mihi licuit quin *Sanguis* à me in Vase Æneo exsiccatus, antequam in Fornace Figuli torreretur, permultas ex Ære, Igne avulsas, partes *Vitrioli Salino-Acidas* intra textum suum interius admisisset, quæ cum partibus ejus *Salino-Acribus* strictissimo, ne dicam indissolubili, Nexu copulatæ *Salsum* efformaverant corpus, è quo *Spiritus* meus *Acidus* elicitus fuerat.

Cum hæc apud me, anxius sanè, aliquandiu meditatus essem, & multum dubitarem an ex *Sanguine Humano*, qui nullo extraneo *Sale Acido* gravidus esset, Liquor Acidus educi posset, rei tanti momenti veritatem indagare, & meum, si quis esset, errorem detegere statui, Quamobrem *Salis Fixi* è *Sanguine Humano* à me in Vasis Figulinis exsiccato eruti, *Unciam* unam exactissimè miscui cum *Unciis* tribus *Boli* siccissimi, & tenuissimum in Pulverem redacti; mixtum hoc in *Retortam* Luto, uti solet, obductam immisi; hanc deinceps in *Chymica* mea Officina Reverberii Furno imposui, & Cervici ejus adhibito aptatoque Excipulo, atque junctûris Vesicâ Suillâ madefactâ opertis, & ritè obturatis, Igne primùm lento, ac deinceps gradatim, quantum oportebat, aucto *Phlegmatis Drachmam* semissem cum *Granis* 10. Extraxi, *Drachmas* vero 3. *Spiritus Acidi* primum Extracto *Spiritui* prorsus similis: Hicce *Spiritus* dentes plurimum stupeficiens Gustus judicio inter Liquores omnes *Acidos* feré *Acidissimus* mihi videtur, & omnes omnino habet dotes, quas *Spiritum Acidum* primò è *Sanguine* elicitum habere diximus. Felicissimus hic meditationum mearum Laborumque meorum successus, qui totam mentem meam blandâ profectò lætitiâ perfudit implevitque, concepta omnia circa Extractionem *Salis Acidi* è *Sanguine* dubia mihi abstulit penitùsque delevit.

Demum è Residuâ in funda Vasis Materia *Lixivium* confeci, ex quo *Drachmas* 5 *Salis Fixi* subalbescentis Extraxi. Hinc manifestè patet me totum non elicuisse *Spiritum Acidum*, quem elicere potuissem è *Sale Fixo*, quod una cum *Bolo* in cavitatem Retortæ intruseram: Id autem ex animo sic factum est, ne *scil. Sal Fixum*, cujus Analysin rursus instituëram, omnibus suis partibus *Salino-Acidis* prorsus exuretur. Et vero illud omni suo *Sale Acido* exuere nolui exploraturus subinde an quodammodo discreparet à *Sale Fixo*, è quo primum *Spiritum Acidum* eduxeram, imò & tantum eduxeram quantum suppeditare potuerat. Verùm nullum omnino inter bina hæc *Salia* Discrimen observare licet. Siquidem ambo levem Colorem Viridem prorsus similem tribuunt Tincturæ Florum Malvæ; & licet nullam, saltem sensibilem, patiantur Fermentationem, cum *Spiritus Nitri* aut *Vitrioli* aut quivis alius hujusce generis, ipsis affunditur; vehementer tamen, & æqualiter Fermentescunt, cum unâ vel alterâ *Olei Vitrioli* guttâ irrigantur. Ex his certo certius patet *Sal Fixum Sanguinis Humani* in Vase Æneo exsiccati, è quo primâ vice *Spiritum Acidum* extraxeram, nullis partibus *Vitrioli Salino Acidis* gravidum fuisse; proptereaque, nequaquam dubitandum est, quin prima *Spiritus Acidi* è *Sanguine Humano* Extractio undequaque vera extiterit.

Venit

Venit fortaſſe hoc loco in animum, *Sal Acre-Acidum*, & *Spiritum Acidum* educta è *Sanguine* non trahi ex hoc Liquore Virtute Ignea, ſed ex Igne ipſo, tanquam è Materia, nunc primùm gigni ac effici: ſed experto credite. E *Sanguine* perſæpe ipſemet puro calentis *Solis* ardore elicui ſubrufum *Sal* Saporis illo *Acrioris*, qui in *Sale* Ignis vi extracto percipitur; quam majorem, ut ita dicam, *Acritudinem* continuò Aciditas Linguæ manifeſta ſubſequitur: ac prioris quidem Experimenti hæc ratio eſt, quod *Sol* illius *Salis* acumina parum, Ignis vero multum, obtundit; poſterioris autem hæc, nimirum quod *Sal Acidum Volatile*, cujus vi *Sanguis* naturaliter Fermenteſcit, arctiſſimè copulatur cum particulis *Salino-Acribus Sanguinis* ipſius paulatim refrigeſcentis ubi è Vaſis ſuis emiſſus eſt. Hi porrò diverſi *Sales* mutuò implexi difficilius longè à ſe invicem ſeparantur calore *Solis* benigno & dulci, quàm violento Ignis ardore. Hinc fit, ut *Sal* illud, de quo nunc Sermo habetur, *Acre-Acidum* ſapiat, & vix cum *Spiritibus Acidis* Fermentetur, ſi *Vitrioli Oleum* excipiatis.

Nunc accipite quâ Viâ, quibuſque Adjumentis conſecutus ſim tandem juſtam illam, necnon exactam, Proportionem Quantitatis, quam Corporibus illis quibus *Sanguis* conſtat, Natura tribuit. Primum igitur non unius aut alterius *Hominis Sanguinem*, ſed multorum, eorumque non Sanorum modò ſed Ægrorum, non ejuſdem ſed diverſi ac diſſimillimi Temperamenti, ad exactas Analyſeos Regulas ita examinavi, ut ejuſmodi Liquoris Principia, alia ab aliis, ſeparaverim, & quidem abſque ullâ Subſtantiarum jacturâ. Illud enim tantum videbatur jam eſſe reliquum, ad habendam Quantitatem reſpectivam illorum Corporum, ut ſingula ſeorſim revocarem ad Trutinam; ſed profecto plus aliquid requirebatur. *Phlegma* enim, *Spiritus* ſubrufus, & *Oleum* fætidum ſecum partes *Salinas* trahunt, quas neque ſeparare licet, adeòque nec ponderare. *Phlegma* igitur quoddam excogitavi, & compoſui, omnimodam habens ſimilitudinem cum vero *Phlegmate Sanguinis*, quod deinceps appellabo Naturale, quamvis Arte *Chimica* extractum; miſcui *videlicet* pondus dimidii *Grani Salis Volatilis* è *Sanguine Humano* educti, cum duodecim *Unciis* Aquæ Fontanæ diſtillatæ: Ac quamvis duæ illæ moles ita inter ſe eſſent 11525 ad 1, tamen Aqua tota ſic *Salis* tantilli Vim ſenſit, ut ſtatim quidem leviſſimum Candorem, & exiguiſſimum Fætorem quemdam induerit; mixta vero cum Syrupo Violaceo ipſum poſt aliquot horas Viridem effecerit, & *Sublimatum* Coroſivum diſſolutum præcipitaverit.

Hinc mihi primum oborta ingens admiratio Naturæ, Materiam ultrà quàm credi poteſt dividentis; deinde ſpes bona inveniendi quæſitum *Phlegma*. Nec fefellit Spes; molitus enim multa nequicquam animadverti denique 12 *Uncias* Aquæ Fontanæ evadere omnino ſimiles Colore, Odore, Sapore, & Subſtantiæ modo, *Phlegmati* Sanguinis Naturali, ſi ejus quod dico *Salis Granum* unum cum Quadrante intra illas diſſolvatur. Verum quo magis illam binorum hujuſmodi *Phlegmatum* ſimilitudinem explorarem; ſumpſi utriuſque moles duas perfecte æquales, quas affudi ſeorſim duabus æqualibus inter ſe molibus Tincturæ Florum Malvæ incluſis ſeorſim duobus Vaſculis Vitreis æqualis prorſus Diaphaneitatis, Magnitudinis, & Figuræ: Tum verò utrique Tincturæ Viridis Color repentè acceſſit, & quidem alter

alteri adeo ſimilis, ut nihil omnino eſſit, vel certè deprehendi poſſet, inter utrumque diſcriminis. Ad hæc ſumpſi ejuſdem utriuſque *Phlegmatis* Guttas 12 quas ſingulas immiſcui ſingulis 24 Guttis *Sublimati Corroſivi* diſſoluti contentis item duobus Vaſculis vitreis ejuſdem prorſus Diaphaneitatis, Magnitudinis, & Figuræ; ecce autem eæ *Sublimati Corroſivi* Guttæ omnes eodem penitus ad ſenſum Candore, Lacteo *ſcil.* effectæ viſæ ſunt, atque mox in Pulverem Candidum æqualem æqualiter Præcipitatæ. Patet igitur Luce clarius illa *Phlegmata* ita eſſe inter ſe paria, ut nihil magis; quare cum artificiale *Phlegma* unum tantum habent *Salis Volatilis* Granum cum quadrante, Naturale 12 Unciarum tantundem quoque habet in ſe, nec plus, nec minùs.

Quoniam verò Arte Natura rimanda eſt, & notis ignota inveſtiganda, per confectum Induſtriâ *Spiritum* quemdam ſubrufum aggreſſus ad indagandam *Salis Volatilis* Quantitatem *Spiritui* Subrufo naturali ingenitam; poſt multa priùs fruſtrà tentata, repetitaque Experimenta, tandem animadverti ex 27 *Granis Salis Volatilis Sanguinis* in *Drachma* una *Phlegmatis* ejus diſſolutis exiſtere Liquorem Colore, Odore, Sapore, modoque Subſtantiæ, penitus ſimilem ſubrufo *Sanguinis* ipſius *Spiritui*, qui nihil eſt aliud, quam *Phlegma* gravidum *Sale Volatili*, & propter accuminatas *Salis* ejuſdem particulas, & paucum ſibi admixtum *Sulphur*, aſperum & graveolens, imo & idoneum ad effectus infra memorandos.

Plenam porrò, atque perfectam in omnibus inter illos duos Liquores (quorum primum Artificialem, alterum vero Naturalem *Spiritum* ſubrufum appello) ſimilitudinem probare volens, in ſingulas duas eorum moles æquales vitreis Scyphis contentas injeci 4 *Guttas Spiritus Vitrioli*; unde æqualis omnino ex utraque parte ſecuta eſt Fermentatio: Deinde in duos Scyphos vitreos Diaphaneitate, Magnitudine atque Figura pares, quorum uterque 20 Guttas Tincturæ Florum Malvæ continebat, utriuſque Liquoris Guttas 5 inſtillavi; unde ſtatim extiterunt in utraque Tinctura pulcherrimi Colores duo Virides, *Smaragdi* inſtar, & ita ſimiles; ut quantumvis intentos Oculos grato Errore deciperent. Denique Guttas 6 unius cujuſque *Spirituum* eorundem in Vaſcula duo infudi, quorum ſingula 40 Guttas *Sublimati Corroſivi* diſſoluti habebant; unde duo emerſerunt Colores Candidi perfectè ſimiles, peractaque prorſus ſimilis Præcipitatio in pulverem Coloris Candidi aliquantulum Rufi.

Ex jam dictis perſpecta penitus, nec non explorata manet omnimoda ſimilitudo, inter duos *Spiritus* Subrufos ſupra memoratos; Artificialem nempè, atque Naturalem: Quamobrem quantum una *Drachma* Artificialis *Spiritus* continet in ſe *Salis Volatilis Sanguinei* (continet autem *Grana* 27) tantùm præcisè quælibet *Drachma Spiritus* illius Naturalis Sinu ſuo complectitur.

Dum perfectam Cognitionem Quantitatis *Salis*, quod *Oleum Fœtidum Sanguinis* ex Alembico Vitreo diſtillati ſecum aufert, mihi comparare meditabar, peculiarem *Olei Fœtidi* Analyſin inſtitui. Hujus *Olei Unciam* unam cum *Unciis* tribus *Boli* ſicciſſimi, & in Pulverem ſubtiliſſimum redacti, exactiſſimè miſcui: mixtum illud in Globulos exiguos diviſum in parvam Retortam Luto munitam intruſi; eamque dèinceps Retortam Cervici ejus convenientis magnitudinis

tudinis Excipulo, ut decebat, adhibito aptatoque, in Furno Reverberii collocavi, factisque ritu solito reliquis faciendis, Igne leniſſimo *Drachmam* semiſſem cum *Granis* 10 *Phlegmatis* limpidi à *Bolo* ſuppiditati primum elicui; mutatoque Excipulo, ſtatim atque prima Gutta *Spiritus* Subrufi ſeſe mihi in conſpectum dedit, & altero in locum illius ſubſtituto, utque par erat concinnato, *Unciam* ſemiſſem cum *Drachma* ſemiſſe & *Granis* 12, *Spiritus* Subrufi, *Spiritui* Subrufo Artificiali ſuperiùs memorato prorſus ſimilis, Igne paulo Intenſiori quàm antea eduxi; poſtmodum *Olei* Colore, modoque Subſtantiæ, omnimodam ſimilitudinem habentis cum *Bile*, intra *Veſicam Felleam* naturaliter reconditâ *Drachmas* duas & ſemiſſem cum *Granis* 21, Igne Intenſiſſimo erui. Antequam ulterius progrediar hîc obiter notari velim, id diſcriminis eſſe inter *Spiritum* Subrufum & *Oleum*, de quibus nunc agitur, quod *Spiritus*, utpote ſolùm è *Phlegmate Saleque* conflatus, Ignem extinguat, ut patet dum illius Guttæ quædam Carboni accenſo affunduntur; *Oleum* verò, quippe quod *Sulphureis* & *Salinis* tantum partibus conſtat, æque cito ac Pulvis Pyrius ferè accedatur, totumque in Flammam ampliſſimam valdeque nitidam abeat, cum primum Igni admovetur.

Demum ex *Lixivio* à me confecto è reſidua in fundo Vaſis materia *Grana* 8. extraxi *Salis Fixi* Nigricantis, Aëris humiditatem facilè ſuſcipientis, & Linguam vehementer exaſperantis atque pungentis, quod cum *Spiritibus Acidis* Fermenteſcebat, & Tincturam Florum Malvæ Viridem efficiebat. Ex jam dictis facilè atque manifeſte colligi poteſt *Unciam* illam *Fœtidi Olei Sanguinis* cujus Analyſin exactiſſimam inſtitui, 19 tantum *Grana* Terræ continere, quæ cum *Bolo* mixta remanſere.

Et vero cùm inter *Spiritum* Subrufum ex *Oleo Fœtido Sanguis* elicitum & *Spiritum* Subrufum, tum Arteficialem tum Naturalem, de quibus antea Sermonem habui, nec Colore, nec Odore, nec Sapore, nec Subſtantiæ modo, nec Effectibus ullis, aliquid interſit diſcriminis, ad firmiter credendum adducor unumquemque *Spiritus* Subrufi, de quo nunc agitur, *Drachmam*, ut & *Drachmam* quamlibet *Spiritus* Subrufi Naturalis è *Sanguine* ipſo eliciti, *Grana* 27 *Salis* continere.

Quod attinet ad Quantitatem *Salis* impliciti, nexuque indiſſolubili copulati, cum ramoſis particulis *Olei* ex *Oleo Fœtido* Liquoris Humanæ Vitæ Fontis educti; hæc facilè, meo quidem judicio, detegi poteſt; etenim cùm hocce *Oleum* Fætore & Acrimoniâ prorſus imitetur *Spiritum* Subrufum, qui ex eodem quo ipſemet *Oleo Fœtido Sanguinis* educitur, ac præterea Tincturam Florum Malvæ eodem planè modo Viridem faciat, neceſſum eſt ut unaquæque illius *Drachma Grana* 27 *Salis Volatilis* intra textum ſuum interius recondat, quæ illud Fætore, Acrimoniâ, & Quantitate illâ quâ Tincturæ Florum Malvæ Viridem tribuit Colorem, prorſus ſimile reddant *Spiritui* huic Subrufo, qui in Diſtillatione *Olei fœtidi Sanguinis* ipſi præit.

Habitâ ergo jam, planéque cognita, ex ſuperioribus Quantitate *Salis Volatilis*, quam ſive *Phlegma*, ſive *Spiritus* Subrufus, ſive *Oleum Fœtidum Humani Sanguinis*, ſecum ferunt cùm diſtillantur, nemini prorſus jam poteſt eſſe, non dicam ignota, ſed ne dubia quidem, ullo modo, juſta illa Proportio Ponderis, ſeu Quantitatis, quæ à Natura inter ea ineſt corpora quibus

Sanguis

Sanguis Humanus conſtat; ſeparari enim à ſe invicem profecto poſſunt, & quidem ſine ullâ Imminutione Subſtantiæ: Separavi enim ipſe ſucceſſu plane felici; poſſunt pariter ſemel ſeparata ponderari, adeoque juſta ſingulorum Quantitas ex Pondere haberi poteſt. Audire vero mihi videor ſic fortaſſe Objicientes; *Sal* extractum è *Sanguine*, ac præſertim *Volatile*, Fætidum eſt; retinet igitur in ſe *Sulphureas* multas Particulas, quarum nec Pondus propterea nec vera poteſt haberi Quantitas. Hoc quidem appoſite mihi Objectum fateor. Verum quod in *Sale Sanguineo* reperitur *Suphuris*, ita exiguum eſt, ut nullius momenti eſſe videatur.

Viſum præterea eſt hic pauca referre de Inſtituta, tribus circiter abhinc Annis, peractaque accuratè à me *Eilis* Analyſi. Quinta enim decimà *Feb.* 1696. ex ea prodire coegi *Phlegma* quoddam ita limpidum, atque pellucidum, ut inter Liquida nullum magis, deinde Liquorem Lacteum inſtar Lactis ipſius candidum elicui, tum alia quædam Corpora, quæ hîc prætereo; demum obtutibus omnium circumſtantium illud expoſui *Phlegma* & Aquam illam Lacteam, quæ penes me adhuc eſt integra, & omnis expers Corruptelæ, ſed non jam ejuſdem Candoris 1. Magna mihi apud meipſum de hujuſmodi Aqua fuit Quæſtio, eoque tandem meditando adductus ſum, ut planè crederem *Chylum* ex *Bile* in Tenuibus *Inteſtinis* diffusà *Volatile* haurire *Sulphur* onuſtum *Sale Acri* ſimiliter *Volatili* partibus ſuis *Salino Acidis* ferè exuto, adeoque admodum leni; nec dubitavi aſſere *Sulphure* illo, *Sale Acri-Acido* leniſſimo gravido ac velut condito, *Chylum* albeſcere, diſponi ad Fermenteſcendum in Cavitatibus Cordis, & ad Formam *Sanguinis* facilius accipiendam præparari.

Unde conſequens eſt *Bilem* ab *Hepate* ad *Inteſtinum Duodenum*, *Choledochi* Meatus interventu, naturaliter amandatam, novum ſingulis diebus, extra omne dubium ſuppeditare Fermentum, *Maſſæ Sanguineæ*, quod nativis illius Fermentis (dummodò ipſa Naturalis ab Indole ſua non deſciverit) Vigorem inſpirat, & eorum jacturas reparat; atque adeò Fermentationis Naturalis ejuſdem Liquoris perennitati mirum in modum confert. Quam mentem meam, ſi non penitus certum admodum certè probabilem, ſequenti Experimento confirmavi. In *Drachmam* unam *Bilis* tepidæ recens è *Veſica Fellis* Vervecis extractæ & intra collum Infundibuli vitrei contentæ, *Uncias* 8. Aquæ Fontanæ imbutas exiguo *Vitrioli Spiritu* injeci; ſtatimque aqua illa Albedinem aſſumpſit ferè Lacteam, majorem aſſumptura, ſi 4 *Salis Abſynthii Grana* ipſi admiſcuiſſem.

Poſtquam vero Experiendi finem feci, monui quod priùs compereram, nimirum *Phlegma* quoddam, elicitum ex Pane, quod ſecum aufert in Diſtillatione *Sal Acidum Volatile*, ſi qua par eſt copià in *Bilem* projiciatur, Lacteam quamdam, ſoliditatem, Lacteumque Colorem accerſere. Illud *Phlegma* Tincturam Heliotropii, & Florum Malvæ Rubefacit; ſed, quod majus eſt, Rufus Panis ejuſdem *Spiritus* cum *Sale*, tum *fixo* tum *Volatili Sanguinis* diutiùs Fermenteſcit, quam quivis alius Fluor Acidus. Unde maximum, ne dicam inexpugnabile deſumitur Argumentum dicendi magnam ex Pane, quo potiſſimum veſcitur *Homo*, *Salis Acidi* copiam educi, quod una cum *Acido-Nitro-Aëreo* jamjam memorati Liquoris Fermentationi excitandæ, atque ſuſtinendæ, plurimum conducit.

2. Ne

2. Ne Nobis, tuam huc transmissam *Chymicam Sanguinis Analysin* & superstructas Meditationes candidè ad Examen revocantibus, ullæ occurrant Ambages, patiaris, rogamus, ut protensum ordinatumque tuorum Experimentorum progressum in duo potissimum restringamus Problemata, quæ nostræ hujus Responsionis Scopus erunt: Quærentes *Scil.* prius, An præter *Sal Acre*, & *Alkalinum*, *Volatile*, & *Fixum*, ullum *Sal Acidum*; & an qui tuâ Industriâ ab *Humano Sanguine Spiritus Acidus* elicis, eidem circulanti *Sanguini* præextiterit? Posterius verò, Num *Proportio*, quam partes *Sanguinis* à Natura interse Quantitatis, & Ponderis, habent, ullâ Arte ad certas Regulas reduci possit?

The Opinion of the Coll. *of* Physicians *at* Rome; *concerning Dr.* Vieussens's Analysis *of* Humane Blood; *by* Jo. Maria Lancisi. n. 264. p. 599.

Quantum ad prioris attinet Problematis Solutionem, tecum fatemur solidum esse Errorem, *Sal Acidum à Sanguine* separari non posse: qui enim hoc negant, supponunt *Acidum Sanguini* non inesse: Esse autem vel ipse docuit *Hippocrates*; & quod omni plus valet Auctoritate, multæ rationes, atque obvia plurima Experimenta apertissime convincunt. Etenim *Sal Marinum*, aliaque multigena *Salia Acida* passim cum Cibis & Potibus intra Sanguifera infundimus, quæ, quanquam in Statu Naturali majori ex parte dulcificata Volatilizentur per *Alkalina*, sæpe tamen fit, ut in Morbis, ad nativum Fixationis Statum restituta, secernantur à *Sanguine*, & extra Corpus deriventur sub forma *Sudoris*, *Salivæ*, *Urinæ*, aut aliorum Ichorum, ad Gustum evidentissime *Acidorum*. Neque ullus dubitationi locus esse videtur, quin *Sal Marinum*, quod inter *Acida* reponitur, Sanorum etiam *Sanguini* inexistat; si enim portio aliqua *Cruoris* è *Vena* prosilientis; super Talci laminam extendatur, ac sponte exsiccanda relinquatur, curiosum exhibet Spectaculum illam cernenti per *Microscopium*, duplex enim *Salis* Species occurit, una quidem Figura *Salis Communis*, altera verò *Salis Volatilis*. Quinimo *Sanguis* in Furno exsiccatus, Ignique admotus, Flammam concipit cum Strepitu, Crepituque, *Marini Salis*, ut notat Clarissimus *Boylæus* in *Hist. S. H.* qui ad *Tit.* 22. ejusdem *Historiæ* pressiùs loquendo, scribit se valida Calcinatione tres aut 4 *Drachmas Salis Fixi Sanguinis* extraxisse, quod comperit, ut expectabat, ad instar *Marini Salis*. Jure igitur constante, vel ad Oculum, existentia *Salis Acidi* intra *Sanguinem* concludi meritò potest, idem *Sal Acidum*, obstetricante *Chymicâ*, ab eodem *Sanguine* extrahi posse. Accedit, quod cum nullus sit, vel Hospes in Chymia, qui *Fœtidum Oleum* à *Sanguine* excludat, nullus pariter *Acidi* existentiam in *Sanguine* poterit inficiari, cum Naturalem *Olei* compositionem *Sulphureum Acidum* ingrediatur.

Lib. de *Vet. Med.*

Dubium solummodò quod hac super re nobis adhuc superest, illud esse videtur, an Liquidum, quod tu *Sal Acidum* particulari Analysi ex *Fixo Sanguinis Sale* secerni posse demonstras, & *Spiritum* Irritantem, atque ipso *Spiritu Aceti Acidiorem* esse pronuncias, in totum atque integrè sit ex *Sanguine*? An potius aliis incurrentibus, vel admixtis in ipsa præparatione corporibus, aliquid suæ *Aciditatis* debuisse affirmandum sit? Quanquam enim nonnulli ex Chymicis, cæci quadam in Parentes fide, constantissimè tueantur Ignem, in Spagyricis Distillationibus rebus ipsis admixtum illarum Texturis haud irretitum iri; Ingenuus tamen atque æque Experientissimus *Boylæus*, de *Chymica Sanguinis Analysi* agens, aperte fatetur, sibi non constare, num frequentibus

Chym. Scept. Hist. S. H. Part. 4.

tibus Deſtillationibus, particulæ quædam Ignis non poſſunt identidem aſſociari particulis Deſtillati Liquoris. Et cum nemo ſit qui ignoret, Ignem eſſe *Acidum Sulphureum*, nemo ſane hac de re ab omni ſe liberare poterit ſuſpicione, *Spiritum Acidum*, qui à *Sanguine Calcinato* mediante Igne Reverberii elevatur, aliquam ſaltem ſuarum conſtituentium partem Ignis Miſcelæ nequaquam debere. Nequæ vero hujuſmodi Objectum diluitur per illud, quod tu ſubdis tentatum Experimentum Calcinandi *Sanguinem* ad nudos *Solis Radios*; Ji enim, & probe noſti & Ignis ſunt, & Ignem accendunt. Quid! quod Cineres, poſt Calcinationem libero Aëri expoſiti, ab *Acido* ambientis *Salem* multum poſſunt mutuari.

Sed mittamus hæc; ponentes pro certo, quod circa Ignis apud Corpora Deſtillata mixtionem, & circa hauſtum *Acidi Spiritus* ab Aëre, nos adhuc tenet in ancipiti. Ad id veniamus, in quo omnes Chymici unanimiter conſentiunt, & tu quoque Cl. Vir, in Schedâ Prælo commiſſa publicè profiteris Terræ omnes Bolares *Spiritu* gaudent *Acidulo*, quo fit, ut ſi ipſæ ſeorſim à quovis alio Corpore, per Retortam Deſtillentur, *Acidum Spiritum* de ſe emittunt. Quis igitur attente animadvertens modum quo tu *affixo Sanguinis Sale Spiritum*, *Aceti Spiritu Acidiorem* ſeparas, maximo ſtatim jure non ſuſpicabitur, *Acidiſſimum* hunc *Spiritum* non ſolius *Sanguinei Salis Fixi*, ſed duplæ majoris *Boli* partis, qua in Deſtillatione admiſces, prolem habendam eſſe? Atque ea quidem ulteriori cum ratione qua Chymici ſolent ex Marino Exempli cauſa, *Sale* eo copioſiorem *Acidum Spiritum* elicere quo majorem *Boli* molem eidem admiſcuerunt. Adeo vera ſunt, & *Boli* miſcelam ad *Acidi Spiritus* productionem, ac multiplicationem plurimum conferre; & neminem certe affirmare poſſe, id quod à Mixtura *Fixi Sanguinis Salis* ac *Boli*, Chymicis ex Organis profluit totum ab alterutrius Textura ſolummodo derivare.

Sed inquis, Vir Clariſſime, ſi vos firmum ratumque habetis *Humano Sanguini Marinum* præ cæteris *Sal* naturaliter ineſſe, modum ſaltem oſtendite, quo citra novi corporis additamentum, *Acidus Spiritus* ab eodem elevari poſſit? Profecto, ne tecum tenaciores videamur noſtrorum Experimentorum, quam Viris congruat ad Libertatem natis fatemur, nos, animo revolventes, *Bolum* deſtillandis *Acris Salibus* eam cauſam admiſceri, ne Igne fundantur, fuſaque *Spirituum* Aſcenſum præpediant, ſtatim cogitaſſe, num *Boli* locum in extrahendo *Acido Sanguinis Spiritu*, ipſa Damnata *Sanguinis* Terra, *Salium* particulas utcumque diſgregans, ſatis tenere poſſet. Qua de re diligentiſſimus ex Noſtris Artifex *Franciſcus Pirotti* ſumpſit Fœcis illas obſcuras, lucidaſque *Sanguinis*, quæ poſt Deſtillationem omnium partium *Volatilium* in Retortæ fundo inveniuntur, quæque *Marino* præſertim *Sale* ſunt gravidæ, eaſque in Vitream humilioremque Retortulam ſolas transfundit: Ira enim, reliquis ex Arte concinnatis, ſpe noſtra minime fuimus fruſtrati, nimirum Igne Reverberii fumus aſcendit, qui reſolutus eſt intra Recipientis fundum in Guttulas Liquoris moderatè *Acidi*, cum aliis *Acidis* nullo modo, eſt cum Alkalicis evidenter Luctantis; in qua certe Operatione dubitari non poteſt, quin *Acidum* quod à prædicto effluit Capite Mortuo, ſit ipſius *Sanguinis* Incola, cum nullum corpus Advena, præter Ignem, eidem admixtum fuerit.

Neque

Neque idcirco in Controverſiam ponimus *Acidiſſimum* illum, tua Induſtria elicitum *Spiritum*, ut ſuperius obiter tetigimus, aliqua ſaltem ex parte ab ipſo *Sanguinis Sale* profectum fuiſſe. Etenim tecum ſentimus, *Sal Fixum Humani Sanguinis* non eſſe unius ſimplicis Naturæ, ſed Androgynum, mixtum nempe ex *Acido* & *Alkali*. Et quoniam ea eſt *Fixi Salis Alkalici* Textura, ut Igne Reverberii ſtrictiſſime cohærens, Vitrificetur potius quam Atomum de ſe elevari ſuſtineat; & monet etiam *Hoffman* exinde eadem facile tollitur difficultas, quæ circa Diſtillationem *Fixi Sanguinis Salis* minus in Chymia peritis occurrere poſſet; *ſcil.* unde fiat, ut ex Cinere *Humani Sanguinis*, apparenter *Alkalico Acidus* tamen *Spiritus* ſublimes: Partes ſiquidem *Salis Alkalici* Fixantur magis, & pene Vitrificantur in Retorta, dum reliquæ *Acidi Salis* particulæ elevationis motum acquirunt.

Alterum jam nos *Problema* ſollicitat, cujus porrò Solutionem quanquam Ingenium tuum miris modis, ac repetitis Experimentis ſummoque Labore, tentare aggreſſum fuerit, nihilominus, num omnis ideo ſuperata ſit, aut ſuperari poſſit Difficultas, maximopere dubitamus. Etenim quanquam *Proportio* partes inter Conſtituentes & Maſſam ipſam integram *Sanguinis* revera inveniat in ſingulis Individuis Individuam operationem, attamen unam Univerſalem certamque iſtius *Proportionis* Normam, quæ cunctis congruat ſingularibus *Sanguinibus*, inveniri poſſe, vero ſimile magis quam verum arbitramur. Et ſane multa ſunt Argumenta, noſtro quidem Judicio, quæ hujuſmodi *Proportionem* nobis in aperto venire poſſe, omnino impoſſibilem reddunt. Primo quidem apud omnes *Mechanicos* & *Arithmeticos* indubitatum eſt Axioma, veram *Proportionem* Ponderis Partium ad Totum, ſeu è converſo Aggregati ad Aggregantia, haberi non poſſe, quin certo nobis conſtet Pondus Totius & Partium, ſeu Pondus Aggregati & Agregantium. Sed hic, exuta quavis præoccupatione, neminem certe putamus futurum liberæ Mentis, qui non cognoſcat, & fateatur, difficultatem & impoſſibilitatem evidentiæ iſtorum Ponderum, Etenim quantum ſpectat ad Totum nempe *Sanguinem*, quis eſt, qui non videat certam ac determinatam *Cruoris* menſuram eandem in omnibus haud inveniri, cum vel in ſingularibus ægre ſatis inveniatur? Quo fit, ut Scriptorum aliqui Libras *Cruoris* 8. alii 20. alii 22 alii plures alii minores, admittant in *Homine*. Neque vero hujuſmodi difficultas extrahendi verum *Sanguinis* Pondus, ulla Arte vinci poteſt, cum non tantum varient ac diverſificentur ab invicem continentium canalium Diametri in ſingulis individuis: Sed quod pluris eſt, totus ac univerſus *Sanguis* ab *Homine*, etiamſi ſauciatus fuerit in jugulo, exhauriri nequit, ac proinde ad Lancem venire non poteſt. Tot enim ſunt Canalium Obliquitates, Viſcerum Anfractus, ac præſertim tanta eſt Vaſorum *Venæ Portæ* amplitudo, quæ à *Cavæ* ramis, toto *Hepatis* interpoſito aggere, diſtat, ut multus ſit *Sanguis* qui vel in ipſis mactatis & per pedes ſuſpenſis Animalibus ſupereſt in Abdomine.

Neque vero ad infirmandum Robur noſtri Argumenti valet ſubterfugium, quod nempe ad obtinendam ſcientiam *Proportionis*, totum inter & partes, ſatis ſit noſſe particulare Pondus unius Molis, Toti ſimilis, & noſſe deinde particularia Pondera Principiorum diſſimilium, ſed Aggregantium unam

molem Toti ſimilem: *Scil.* quod in Caſu Noſtro æque benè attingere poſſimus normam *Proportionis* quæ *Sanguinem* inter & ſua Principia intercedit, ſi exacte Sciverimus verum Pondus alicujus ſaltem molis *Sanguinis*, ſimulque noverimus particularia Pondera diſſimilium Principiorum, eandem molem Aggregantium etenim (quidquid ſit de Validitate iſtius Hypotheſis in Fluidis, certam Gravitatem Specificam habentibus) maxima difficultas verſatur, in determinando vero Pondere unius molis *Sanguiuis*. Toti ſimilis, & indetegenda eadem in ſingulis *Proportione* Principiorum diſſimilium ſed Aggregantium ſupra dictum molem *Sanguinis*. Et prius quidem, quia *Specifica* Gravitas *Humani Sanguinis* difficilius, quam quis ſibi fingit, ſtabiliri poteſt, ut ad rem noſtram poſt *Sanctorium* ſcribit *Boyle*; ea enim variat eodem in *Homine*, diverſo Anni & Diei tempore, vel quod majori minorivé ab aſſumpto Cibo intervallo extractus fuerit. Quid non etiam *Arterioſus* à *Venoſo*, & *Venoſus Cavæ* à *Venoſo Portæ* multo *Specificæ* Gravitatis diſcrimine inter ſe diſtant? Non igitur certo conſtare nobis poteſt, vel Pondus Totius *Sanguinis* in omnibus aut in ſingulis Hominibus, vel *Specifica* Gravitas cujuſcunque molis ejuſdem Fluidi.

Poſterius vero multo adhuc minus haberi poteſt, aut determinari Pondus ſingularum Partium, Aggregantium vel univerſum *Sanguinem*, vel particularem ejuſdem molem, quia fieri non poteſt quin ejuſmodi Partes, ſeu Chymica Principia, additione novorum corporum, Igne nimirum, Bolo, aut Acre, vel detractione nativarum particularum, inſenſibiliter in Auras avolantium, priſtinum propriumve Pondus, ac proinde veram inter ſe *Proportionem* admodum varient. Ex quo factum legimus, ut, cum præcitatus diligentiſſimus *Boyle* ſtuduiſſet accuratam *Humani Sanguinis* Deſtillationem, attamen poſt quam ſigillatim Extracta illinc corpora Ponderaſſet, evidentem in iiſdem multarum *Drachmarum* defectum obſervaverit: atque idcirco Paradoxum jure vocat, quod Chymici nobis imponere ſatagunt, in Deſtillationibus accurate factis, ſeparata corpora ad Totius Pondus exactiſſimè recurrere. Neque vero dum hæc aſſerimus, *Boylii* aliorumque Ingenuorum Scriptorum Fidei duntaxat innitimur; tentata namque per nos etiam ſedula, quantum fieri potuit, Spagyrica *Humani Sanguinis* Anatome, ſeparatæ partes Pondus Toti æquale minimè reddiderunt. In *Unciis* enim 7. & *Drachmis* 7. *Sanguinis*, poſt Deſtillationem plus *Semiuncia* deſideratum eſt; id quod proculdubio tuis etiam in Experimentis contigiſſe ſuſpicamur.

Cum igitur ut verum neque Totius neque Partium *Sanguinis* Pondus nobis liquido conſtare poſſit, nulla pariter vera *Proportio*, quæ illa inter corpora intercedat, nobis cum ſpe aliqua quærenda ſupereſt.

Accedit deinde impoſſibilitati ex parte Artis, certum Pondus Totius & Partium *Sanguinis* attingere nequeuntis, ea impoſſibilitas quæ oritur ex parte Naturæ ipſius *Sanguinis*: Qui cum Indole non ſit idem in ſingulis, fruſtra ab eodem *Proportionem* petimus quæ omnibus *Hominibus* congruat, & commenſuretur. Differt enim Natura à Natura, ut aiebat *Hippocrates*, nempe juxta diverſa Alimenta, Ætates, Regiones, Anni Tempeſtates, Sexus Animi Pathemata, Corporis Exercitationes, ac potiſſimum Viſcerum Structuras, ac Fermentorum Vires, diverſa oriuntur in Hominibus Temperamenta, quæ

varium

varium longèque diverſum in uno quam in altero *Sanguinis* Componentium exceſſum, aut defectum, (quod idem eſt ac *Proportionem* dixiſſe) & ſignificant & ſupponunt. Exinde fit, & Hominum, tum Mores cum Morbi, tanto Intervallo inter ſe non modo diſtent, ſed commutentur. Neque vero multis opus eſt Argumentis, ad probandam facilem Variationem Componentiam maſſam *Sanguinis*, in uno quam in altero individuo, cum, te aſſerente, vel unicum *Granum* cum Quadrante *Salis Volatilis Humani Sanguinis* integram *Libram* Aquæ deſtillatæ perturbare, & novam in eadem *Proportionem* 1 ad 11525 inducere apta fuerit. Hæc ſane multorum inter *Sanguinis* Diſcrimina, quæ nemo ſenſatus inficiari poteſt, abundè confirmantur ex Vino & Lacte, quæ cum ſint Fluida Heterogenea, & *Sanguini* admodum Analoga, à Regione ſolo, Anni tempore, atque Ætate, ſuis in Componentibus eo uſque alterantur, ut nullam, certe Veram, *Proportionis*, Regulam, quæ ſingulis competat, poſſint admittere.

Poſtremo enixè petimus, ut relictis generalibus Hypotheſibus, ſedulo perpendas expoſitum à te *Proportionem Drachmæ Salis Fixi* ad *Lib.* 50. *Sanguinis*, ex quibus *Sal* extractum fuit, (mittimus enim hic tot *Libras Cruoris* non unius, ſed plurimorum Hominum, fortè etiam ægrotantium, è *Venis* fluxiſſe, quod multum alterare poteſt Normam *Proportionis* Naturalis) eamque *Proportionem* compares cum illa *Scrupulorum* quinque ejuſdem *Salis Fixi* ad ſolam *Libram* unam *Sanguinis* à laudatiſſimo *Boyleo* diligenter expoſita; comperies enim, mirum dictu! Non ſolum *Proportiones* iſtas non eſſe ſimiles, ſed ita inter ſe differre, ut *Proportio Boyliana Salis Fixi* ad *Sanguinem* ſuperet fere decies *Proportionem Salis Fixi* ad *Sanguinem* per te enunciatam. Quid! Quod hic *Romæ Proportionem* ab utroque Veſtrum longè diverſam invenimus. An vero hujuſce Diſcriminis cauſa referenda ſit integre in diverſas *Sanguinum* Indoles; an etiam in varias præparandi formas, ac vias quibus *Londini*, *Monſpelii*, ac *Romæ* itum eſt, aliorum eſto judicium. Interea, ſatis nobis erit hoc non minuere Argumenti pondus, quod utrinque validiſſime urget: Vel enim in diverſa *Sanguinem* Temperamenta, vel una etiam in diverſa Artificia refundantur Diſcrimina, perpetuo ipſa inſuperabilis *Varietas* infidam reddit quæſitam à Nobis *Proportionem*.

A ſtrange kind of Bleeding, *in a little* Child; *by Mr.* Sam. du Gard. *n.* 109. *p.* 193.

XVI. A *Child* (about a quarter of a Year old) at *Littleſhal* in *Shropſhire*, about *Candlemaſs* 167$\frac{3}{4}$ was taken with a *Bleeding* at the Noſe and Ears, and behind the hinder part of the Head, where there was nothing at all of any Sore. This laſted for 3 Days; at the end of which, the Noſe and Ears ceaſed *Bleeding*: But ſtill *Blood* came, as it were Sweat, from the Head. Three Days before the Death of the *Child* (which was the *ſixth* Day ſince ſhe began to *Bleed*) the *Blood* came more violently from her Head, and ſtream'd out to ſome diſtance from it: Nor did ſhe *Bleed* only there, but upon her Shoulders and at the Waſt, in ſuch Quantities, that the Linnen next her might be wrung, it was ſo wet; and every Day requir'd clean Linnen. She for 3 Days *bled* alſo at the Toes, at the bend of her Arms, at the Joynts of her Finger of each Hand, and at the Fingers ends; and in ſuch meaſure, that in a quarter of an Hour the Mother hath catch'd from the

droppings of the Fingers, almoſt ſo much as the hollow of her Hand would hold. All the time of this *Bleeding* the *Child* never *Cryed* vehemently, but only Groan'd; though about 3 Weeks before, it had ſuch a violent fit of *Crying* as the Mother ſaid, ſhe never heard. After the *Child* was Dead, there appear'd in thoſe places where the *Blood* came, little Holes like the prickings of a Needle.

This Account I had from the Mother of the *Child*, who is a very ſober Woman; and ſhe told it me with Tears. She alſo told me, That the *Blood* was not thin like Water, but of that thickneſs as *Blood* uſually is; and that ſhe and others believed, there was little or no *Blood* left in the Body of the *Child*.

A Periodical Evacuation *of* Blood *at the end of the* Fore-Finger; *by Mr.* Aſh. *n.* 171. *p.* 989.

XVII. *Walter Walſh*, an Inn-keeper in *Trym*, born in *Ireland*, of a Temperate Dyet, Sanguine Complexion and pleaſant Humour, in the 43 Year of his Age. *Anno* 1658, about *Eaſter*, was ſeiz'd with a great Pain over all his Right Arm; a great Heat, and Redneſs in his Right Hand; and a pricking in the point of the *Fore-Finger*; whereon there appear'd a ſmall *Speck*, as if a little Thorn had run in: And ſuppoſing it ſuch he open'd it, whereupon the *Blood* ſpun out in a violent but ſmall Stream. After it had ſpent its Violence, it would ceaſe for a while and only drop, and then ſpring out with Violence again, continuing thus for 24 Hours; till at laſt he fainted away, and then the *Blood* ſtanch'd of it ſelf, and his Pains left him. From that time during his whole Life, (which continu'd 12 Years,) he was frequently troubled with like Fits; ſeldom having a reſpite of 2 Months; and they never return'd oftner than in 3 Weeks. He rarely *Bled* leſs than a Pottle at a time; the oftner the Fit came the leſs he *Bled*, and the more rarely it aſſaulted him, he *Bled* the more; whenever they endeavour'd to *ſtanch* the *Blood* it raiſed moſt exquiſite Tortures in his Arm; no Remedies that were ever uſed proved in the leaſt effectual; he had no other Diſtemper that troubled him; neither Seaſon nor Weather wrought upon him; he had no outward Accident that at firſt brought the *Bleeding*; Drinking more than ordinary made him more apt to *Bleed*; he had no Child after his firſt ſeizure. Theſe frequent Fits brought him at laſt very low, inſomuch that towards his latter end he *Bled* but little, and that too but like Diluted Water. He dy'd of this Diſtemper on *Feb.* 13. $16\frac{8}{9}$.

An Eruption *of* Blood *at the* Glandula Lachrymalis; *by Dr.* Clopt. Havers. *n.* 208. *p.* 51.

XVIII. An Icterical diſcontented Woman, having a deſire to Dye, wholly rejected the help of Medicine, and within 3 Months being well nigh her End, there happen'd an *Eruption* of *Blood* out of the *Glandula Lachrymalis* of one of her Eyes, without any External Injury. There was an Evacuation of ℔*ij*. of *Blood*, within the ſpace of 30 Hours. About a Week after the ſame Sluce was open'd again, and ſhe *Bled* till ſhe Dy'd.

An admirable Eſſence for Stanching Blood; *by M.* Denys. *n.* 94. *p.* 6039.

XIX. Here [in *France*] hath been found out an admirable *Eſſence*, which being apply'd to any *Artery* whatſoever, ſtops the *Blood* inſtantly, without any need of Binding up the Wound. We firſt Experimented it upon *Dogs*,

of

of whom I've cut the *Crural* and *Carotid Arteries*, and the Thigh it ſelf: and the *Blood* ſtopp'd in a little while; the Wound healing without any *Scar*, *Suppuration*, or *Cicatrice*. We have alſo made Tryals upon *Men*, of whom the *Temporal Arteries* were open'd; and upon others, whoſe Hands and Face had been cut, and it ſucceeded with them as well as it did upon *Dogs*.

This *Liquor* works not only outwardly, but alſo being taken inwardly; for it ſtops the loſs of *Blood in Fæminis*, inveterate *Fluxes* of *Blood*, open *Hemorrhoides*, and other Hemorrhagies.

Experiments *made with this* Liquor; *by Dr.* Walt. Needham. *n.* 95. *p.* 6052.

XX. 1. *May* 30. 1673. A *Dog* had the Skin of his Neck ſlit open, and flay'd by Mr. *Serjeant Wiſeman*, ſo that the *Jugular Vein* lay bare. He then with his Lancet open'd it, and immediately apply'd to it a Button-pledget of Lint dip'd in the *Styptick* ſent from *France*. This being done, he took up the *Muſcles* on the other ſide of the Throat, and divided them till he came to the *Carotid Artery*. This he likewiſe open'd with his Lancet, and apply'd a Pledget after the manner aforeſaid. Theſe Pledgets being kept on by preſſure of the Thumb about a quarter of an Hour, were then taken off. The Veſſels *Bled*, but not freely: Whereupon the Pledgets were chang'd for freſh ones, and kept on a quarter of an Hour more; being then firſt let looſe, and afterwards taken off, the *Vein* and *Artery* were knit and ſolder'd together.

2. The ſame Day a Patient, whom Serjeant *Wiſeman* had newly Dreſt with a *Cauſtick Stone* in the Neck (upon ſome *Scrophulous* Swellings) was brought back to us in a Coach, having *Bled* all the way, to the wetting almoſt of a whole Sheet. The Veſſel lay ſo deep that it was hard to reach it. However Mr. *Wiſeman* dipp'd two Pledgets in the Liquor aforeſaid, and thruſt them into the two Orifices whence the *Blood* came. It was immediately ſtopp'd, and the Neck Dreſs'd up without any conſiderable Bandage.

3. 1. The ſame Day a Young Woman's Breaſt being cut off, by the ſame Chirurgeon, the *Arteries* were ſtop'd by holding the like Pledgets in the Mouths of them whilſt the Dreſſings were fitted for the Breaſt. The Pledgets being then thrown off, the *Blood* continu'd Stanch, and the Mouths of the *Arteries* remain'd cloſe.

By Mr. Rick. Wiſeman. *Ib.*

2. The Woman, whoſe Breaſt I cut off, *May* 30. 1673. labour'd under a *Cancer* Ulcerated. She was weak and much indiſpos'd by reaſon of the frequent *Bleeding* from a Veſſel out of our reach. About 2 Hours after the Account given above by Dr. *Walter Needham*, ſhe was taken with a *Vomiting*, and her Breaſt *Bled*. I was ſent for, and found her Swooning. I took off the Dreſſings, and perceiv'd one of the *Arteries* to *Bleed* a little. I apply'd the *French Eſſence* and ſtopt it; but doubting the ill conſequence, if it ſhould *Bleed* again in the Night, I ſecur'd that *Artery* by the Touch of a Hot Iron.

By Dr. Walt. Needham. *Ib. p.* 6053.

4. *Jun.* 11. 1673. A Dog's *Crural Artery* was cut quite croſs with an Inciſion-Knife, before the *R. Society*, by Dr. *Needham*. The Blood guſhing out copiouſly, a Lint dipp'd in the ſame *Liquor* was apply'd to the Wound,

Wound, and held upon it a little while; when, by reaſon of the great Glut of *Blood*, that could not be well wip'd away for want of a Spunge, (which made the Experimenter conjecture the Application had not been exactly made) the Lint was chang'd for a freſh one dipp'd in the *Liquor*, and kept on about half an Hour, and being then let looſe, the *Blood* was ſoon *ſtanch'd*; whereupon the Dog being unbound, lick'd the Wound, and walked away without any Ligature.

By M. Denys. *Ib.* 5. *Jun.* 18. 1673. Mr. *Denys* himſelf being come to *London*, made another Tryal before the *R. Society*. In the *Crural Artery* of a *Dog* was made an oblique wide Cut, and the *Liquor* in the uſual manner being apply'd to it, the *Blood* was *ſtanch'd* in 7 *Minutes*, and the *Dog* being then let looſe, but yet kept quiet for 23 *Minutes* longer, he then aroſe and let fall the apply'd Compreſs, and went away without any Bandage.

By ..... *Ib.* 6. *Jun.* 20. 1673. Two *Calves*, of the bigger ſort, were brought into the *Banquetting-Houſe* by the *King*'s Command. The *Crural Artery* of one of them being laid bare, it was Cut open long-ways with a Lancet, and preſently a Lint dipp'd in the ſaid *Eſſence* apply'd to the *Wound*. The *Blood* was *ſtopp'd* in about a quarter of an Hour: But the Animal being big and ſtrong, and ſtriving continually to get up, the *Artery* broke out again; whereupon a freſh Lint dip'd in this *Healing Water*, was laid on again. The *Blood* was at length ſo ſtopp'd, that about the end of 2 *Hours* the Beaſt aroſe, walked about the Houſe without looſing any *Blood* more, though the *Wound* had no Bandage on it. Of the other *Calf*, the Butcher Cut off quite one of his Legs, as high as he could, and the *Blood* ruſhing out impetuouſly, a Compreſs of Lint dipp'd in the *Eſſence* was preſently apply'd to the Part. Here more care was taken than before, of keeping the Animal quiet; and about the end of a *quarter* of an *Hour* the *Blood* was found perfectly *Stanch*. Several of the *King*'s Phyſicians and Chirurgions did examine the Wounds, after the *Blood* was ſtopp'd, and found them clear without any *Eſcarr*: and his *Majeſty*, who was preſent at theſe Experiments, declar'd himſelf publickly to be very well ſatisfy'd with it.

By ..... *n.* 99. *p.* 6079. 7. The *King* having given order that Mr. *Denys* ſhould be deſir'd to communicate the Secret, a quantity of it was made in his *Majeſty*'s own *Laboratory*, of which Tryals were made upon 3 Calves in *Whitehall*, *Jul.* 12. 1673. a Leg of each of them being Cut off, as high as was poſſible, and the *Blood* of them ſtopp'd with this new *Liquor*, to the admiration of all the Spectators. For this *Water*, having been prepar'd with more exactneſs than ever, the *Effect* of it was ſo quick and powerful, that the *Blood* was ſtopp'd in 4 *Min.* of time; the *Calves* by their Motion making the Pledgets to fall off, that had been put on the Parts Cut, and not a Drop of *Blood* appearing.

By ..... *n.* 95. *p.* 6074. *n.* 96. *p.* 6078. 8. 1. *Jul.* 1673. The Leg of a poor Woman (labouring under an inveterate *Scurvy* and the *Kings-Evil*, in the *Hoſpital* of St. *Thomas*) was Cut off, becauſe of a *Malignant Ulcer*, not ſuffering her to ſleep Day or Night. Immediately afterwards, the *Arteries* were Dreſt with ſome Linnen Pledgets dipt in the *Aſtringent Liquor*, with a Compreſs upon it, and a Bandage keeping

ing

ing all close against the *Arteries*. The Succes was, that the *Blood* was *Staunch* without any other Dressing. And instead of complaining, as those are wont to do who have a Limb Cut off, and the Mouths of whose *Arteries* are Burnt with an Hot Iron, or a *Caustick*, to stop the *Blood*; this Patient lookt very Cheerful, and was free from Pain, and *Slept* two *Hours* after, and also the Night following, and from that time found her self still better and better, without any return of *Bleeding*, or any ill Accident.

2. *Jul.* 5. 1673. In the same *Hospital*, the Leg of a Seaman was Cut off, because of a *Wound*, accompany'd with a *Fracture*, made by a Cannon Bullet. After the Part was Dres't, as above, with Linnen dipp'd in the *Essence*, the *Blood* was *stopt* in less than half a quarter of an Hour. There was made a Bandage, that pressed the Linnen against the Cut *Arteries*; and without any other thing the Patient found himself so eased of the Pains he felt before, that he *Slept* two or three *Hours* after, and all the Night following.

Next Morning, the *Dressings* of the Woman as well as the Man, were taken off in the presence of the Physicians and Chirurgions, who were sent by the *King* to see the Operations; and they all did acknowledge, that no *Wounds* could look more Fair and Ruddy; there appearing no *Escarr* at all, nor any more *Blood* than if there had never been any *Veins* or *Arteries* open'd in that Part.

9. The *Royal Styptique* Liquor was used in the Engagement against the *Dutch*, 1673. by the Chirurgions of the Earl of *Ossory*, Sir *Edward Spragg*, and Sir *John Berry*, and others, with admirable Succes. A very good Physician in *Yarmouth*, several credible Persons also in *London* and other places, (some of whom have taken it *inwardly* themselves) do give the like Commendation of it, for *stopping Bleeding* upon *Erruption*, or Apertion, of a Vessel in the *Lungs* or other *Internal Parts*. *By* ..... *n.* 97. *p.* 6115.

XXI. 1. A large *Dog* being provided, an Aperture was made through the common *Integuments* of his *Abdomen*, whence the *Small-Guts* were extruded; after an Incision made in one of them according to its length, they were again reduc'd; the *Wound* in the *Abdomen* being stitch'd up, a Solution of this *Powder* was apply'd; the *Dog* continu'd without any ill Symptoms, and became perfectly well in a few Days after. The like Experiment I have made on another *Dog*, who in like manner recover'd without the Application of any Medicine. *Experiments made with Mr.* Colbatch's *Styptick; by Mr.* Will. Cowper. *n.* 208. *p.* 42.

2. The *Leg* of a *Dog* was Amputated 3 Inches above the *Patella*; the expence of *Blood* from the *Arteries* was great, which did partly proceed from the unaptness of the Applications which were prepared; but after two or three Attempts the *Flux* of *Blood* was *stopt*, and such a Bandage made use of as was necessary only to keep on the Dressings: The *Dog* continu'd without any considerable *Flux* of *Blood*, and the next Day he was found on his three *Legs*.

3. The Diseas'd Arm of a Man in St. *Bartholomew's Hospital* was Amputated above the Elbow; but for above a quarter of an *Hour*'s time many

succesless

ſucceſsleſs Applications of this *Styptick* were made, and at length a ſmall Tent dipt in the *Powder* it ſelf, inſerted into the Extremity of the *Bleeding Artery*, before the *Flux* of *Blood* would admit the Application of Bandage. Five *Hours* after, a freſh *Flux* of *Blood* appear'd, and ſtrict Bandage was apply'd. The ſame Morning the above-mention'd Amputation was made: a Boy about 12 or 14 Years of Age had his Leg alſo taken off below the Knee, to whoſe Stump divers ſucceſsleſs Appplications of this *Styptick* were alſo made, before it was bound up, and in leſs than an *Hour* after, a freſh *Flux* of *Blood* happen'd, and ſtrict Bandage was added. Some *Hours* after theſe Operations, both theſe Patients ſuffer'd extravagant Pains: Three Days after the Applications were taken off; and had any Perſon, a ſtranger to what had been done, ſeen the Stumps, he would have ſuppos'd nothing leſs than an *Actual Cautery* had been apply'd, or could have occaſion'd ſuch large *Eſcarrs*, and ſo Horrid an appearance; which did ſufficiently denote this *Vulnerary Powder* to be a *Violent Cauſtick*.

Tryals of *Stypticks* on the Bodies of *Quadrupedes* have been commonly practis'd to commend them to the Publick; but it is not without cauſe that Pretenders to ſuch Remedies have made choice of younger Animals, as *Dogs* and *Calves*, &c. for that purpoſe. But ſince the only Standard of their Uſe is their Succeſs on the *Humane Bodies*; we ought to make our Experiments on thoſe Animals, whoſe Magnitude and Age bear a Proportion to it. For, nothing is more obvious in Wounding the *Arteries* of living Animals, than that the Protruſion of their *Blood* bears a Proportion to their Bulk; And in Diſſection, the *Arteries* of the *Fœtus* are remarkably thinner than thoſe of an *Adult*; and thoſe of *Aged* Bodies grow ſtill thicker, and frequently become *Cartilaginous*, and at length entirely *Bony*; of which Dr. *Tyſon* and my ſelf have ſeveral Pieces.

Some Animals having Lungs, yet wanting the Arterious Vein; *by Dr.* Swammerdam. *n.* 94. *p.* 6040.

XXII. In nuperis meis Sectionibus Animalia quædam deprehendi, quibus licet uterentur *Pulmonibus*, *Vena* tamen *Arterioſa* fuerit à Natura denegata, ſic ut *Sanguis* immediate è *Corde*, prævium nullam in *Pulmonibus* Circulationem, aut Conquaſſationem paſſus, per totum Corpus diſtribueretur. Nemo enim, opinor, *Ranis Pulmonis* denegabit, poſtquam Exercitatiſſimus *Malpighius* tam curioſa tamque notabilia de jis divulgavit, atque Solertiſſimus *Gualterus Needham Pulmone* manifeſto eas donari atque *Reſpirare* annotavit: In his tamen Amphibiis *Vena Arterioſa* deſideratur. Quare nec eorum *Sanguis* ullo modo per *Pulmones* Circulatur, in iiſve cribratur, verberatur, aut comminuitur; cum mox ex ſimplici eorum *Cordis* Sinu per totum Corpus, *Pulmonibus* intactis relictiſque, diſpeſcatur. Quod certe haud debile mihi Argumentum videtur, quo, inter alia, *Hepati* ſuum *Sanguificationis* Munus reſtituere aliquando conabor.

Arteria tamen manifeſta (*Bronchiali*, ſeu potius *Pulmonali* Analoga) in *Ranarum Pulmonum* ſuccingente tunica adeſt, quæ mirandum in modum, ac Retis Mirabilis ad inſtar, per eorum Superficiem tenditur, atque minutiſſimis ſuis propaginibus ſenſim ad interiores Veſiculas progreditur; ubi, (ut Ego quidem arbitror,) cum *Vena Pulmonali* Anaſtomaſin patitur, etiam

Oculis

Oculis manifeſtam. *Venoſum* illud Vas *Arterioſo* duplo majus: In *Pulmonum* cavo, ac præcipuè in *Veſicularum* ejus Oris ac Limbis ſitum eſt, a quo omnibus Cellulis, imò & ipſi Tunicæ ſuccingenti, Capillaribus, ac fere inviſibilibus Ramuſculis proſpicit.

Animalia, quæ ſuſpicor eandem cum *Ranis Pulmonis* ſtructuram obtinere, ſunt *Buſones*, *Lacertæ*, *Serpentes*, *Chamæleontes*, *Teſtudines*, *Salamandræ Aquaticæ*, & ſi quæ ſunt alia *Pulmonibus Membranoſis* inſtructa.

An Aneuriſma of the Arteria Aortæ; by Mr. Lafage. n. 267. p. 696.

XXIII. In the Year 1685. a Servant to my Lord *Culpeper*, got a Fall, which caus'd him a Heavy Pain in the Breaſt for a while. About a Month after this Accident, a Musket burſt in his Hands, and gave ſo violent a Recoyle againſt his Right ſide, that it made him *Spit Blood* immediately, and continu'd for 6 Months. A Year after, he began to feel a Pulſation on that ſide, and then he *Spit Blood* again, which continu'd, but only on the Spring and the Fall, till he Dy'd. He *Bled* likewiſe by the *Noſe* twice a Year, for a Month every time. In 1695, or 1696, a Tumor began to appear under the Right Nipple, which growing by little and little, came to an extravagant Bigneſs, and at laſt after uſing ſome Emollient Oyntments upon it (of his own accord) it broke ſuddenly, and he ſoon after Dy'd. Mr. *Lafage* open'd the Body, and found that two of the *Cartilages* of the Ribs were worn off, by the continual *Pulſation* of the Tumour; part of the *Sternum Bone* was alſo worn off, by the ſame cauſe. The *Dilatation* of the *Artery* began preciſely on its Trunk next to the *Heart*, before it divideth it ſelf into the *Aſcending* and *Deſcending* Trunks; and tho' there is but a little place, yet it did *Dilate* it ſelf ſo exceſſively, that the Bag did fill up the whole Cavity of the *Thorax* on the Right-ſide; and preſs'd the *Lungs* ſo much, that they were thereby much diminiſh'd; the Bag by the outſide did adhere to the *Mediaſtinum*, to the *Diaphragma*, the *Pleura*, and to the *Sternum*, in which it had digg'd two great Holes, ſo ſtrong was the Impulſion; The inſide of that Bag was lined, almoſt all over, with *Bony Laminæ*, ſome larger ſome leſſer, like ſo many Shells; The *Heart* was mightily relax'd, in ſo much that it was twice as large as it ought to be; and amongſt its Fibres there were ſome *Stones*, like them which are ſometimes found in the *Lungs* of *Scrophulous* Bodies.

Explanation of the Figures.

Fig. 63. *A*, The *Heart*. *B*, The *Aorta*, next to the *Heart*, where the *Aneuriſma* began. *C C*, The ſame *Dilated*, making the Bag of the *Aneuriſma*. *D*, The *Deſcending Aorta*. *E E*, The two *Axillary Arteries*. *F F*, The two *Carotid Arteries*. Fig. 63.

Fig. 64. *A*, The *Heart*. *b b b*, The *Valvulæ Semilunares*, in the *Bag*. *C*, The *Aorta Deſcendens*. *D*, The Orifice of the *Aorta* into the *Bag*. *E E*, The two *Axillary Arteries*. *F*, That part of the *Bag* where it broke. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. The *Bony Laminæ* in the inſide of the *Bag*. Fig. 64.

Fig. 65. *a, a, a, a*, The *Sternum Bone*. *B*, Its ſuperior part. *C*, Its inferior part. *D D*, Its Right-ſide. *E E*, Its Left ſide, in which the *Cartilages* of the *Ribs G G*, were wanting. *H H*, The place of the ſame *Bone* worn off by the *Aneuriſma*. Fig. 65.

A Communication of the Ductus Thoracicus *with the* Emulgent Vein; *by M.* Pecquet. *n.* 25. *p.* 461.

XXIV. In the Diſſection of a Woman, who Dy'd ſome few Days after ſhe was brought to Bed, M. *Gayant* having diſcover'd the *Ductus Thoracicus* upon the 7th and 8th of the *Vertebra*'s deſcending from the Back, inſerted a Quill into the ſaid *Ductus*, and having ty'd it upon the Quill, he did blow into it: whereupon the *Ductus* was fill'd with Wind from the Quill unto the *Subclavial Vein*. This Wind iſſued at the *Aſcending Cava*, which had been cut: To prevent which, I compreſſed with my Fingers the *Vena Cava* and the *Ductus Thoracicus* together, and M. *Gayant* having blown afreſh into it, we perceived that the *Emulgent Vein* was, on the Left Side, fill'd with Wind, and that thereupon the Body of the *Vena Cava* alſo fill'd itſelf from the *Emulgent* unto the *Iliaques*. This Wind ſeem'd to us to come from the Left *Kidney*, and to inſinuate it ſelf into the *Emulgent Vein*, and thence into the *Cava*. To clear this the more we lifted with the Hand the *Lungs*, that fill'd the Left Cavity of the *Thorax*, and having cleans'd this Cavity with a Spunge, M. *Gayant* did blow into the *Ductus Thoracicus*, whilſt I compreſſed the *Vein* and the *Ductus* with my Fingers upon the 3d *Vertebra*, deſcending from the Back; And we ſaw the Wind inſinuate it ſelf under the *Pleura*, by a Trace, which raiſed it ſuddenly as often as we did blow. This Trace appear'd from the 4th *Vertebra* deſcending into the *Diaphragm*, and made us conclude that there was under the *Pleura* a Channel of Commerce coming from the *Ductus Thoracicus*, and paſſing to the *Emulgent Vein* by this Cavity of the *Thorax*.

Vid. in Sect. XXV. 2. F.

This Channel of *Communication*, we perceived to come from the *Ductus Thoracicus*, at the place of the 4th *Vertebra* of the Back. But to be ſurer of it I compreſt with my Fingers the *Ductus* upon the 5th deſcending *Vertebra* of the Back; and M. *Gayant* having blown into the Quill, which was upon the 7th, the Wind paſſed not to the *Kidney*, nor to the *Emulgent Vein*; Which made us conclude, that the *Communication* was not beneath the 5th *Vertebra*. Then I compreſſed with my Fingers the *Ductus Thoracicus* and the *Vena Cava* upon the 3d deſcending *Vertebra*; and the *Emulgent* ſwell'd, when M. *Gayant* blowed into the Quill: Which gave us more ſtrongly to believe, that the place of the *Ductus Thoracicus*, whence goes the Channel of *Commerce* with the *Emulgent*, was between the 3d and 5th *Vertebra* of the Back. And to be yet more aſſured thereof, M. *Gayant* ſplit the *Ductus Thoracicus* upon the 3d *Vertebra* of the Back, and having blown into it at the Quill, the Wind came out at the *Axillary Vein*, and the *Aſcending Cava*; but the *Emulgent* ſwell'd not at all.

Blood paſſeth where the Air will not.

We alſo made the following Experiment, which ſeem'd very Curious: M. *Gayant* having blown into the *Aorta*, whereof all the Branches that had been Cut were ty'd up, it ſwell'd immediately, and the *Emulgent Artery* grew Tumid at the ſame time: But the Wind, that was protruded thorow the *Emulgent Artery* into the Left *Kidney*, return'd not into the *Emulgent Vein*; which taught us, that the *Blood* often paſſeth where the *Air* does not. For the *Blood* of the *Emulgent Artery*, which goes to the *Kidney*, returns thorow the *Emulgent Vein* into the *Vena Cava*, purſuant to the Rules of the *Circu-*

lation

lation of the *Blood*: But in this Experiment the *Wind* could not pass that way. And we had another proof thereof in the *Lungs* of a Woman which we formerly Dissected, where we saw, that the *Air*, which was propelled thorow a Quill into the *Vena Arteriosa* (which is the *Artery* of the *Lungs*) returned not thorow the *Arteria Venosa* (which is the *Vein* thereof) into the *Left Ventricle* of the *Heart*, though by the *Circulation* the *Blood* pass there with ease; and even *Milk*, which having been let in by this *Vena Arteriosa* return'd easily the same way.

A Communication between the Ductus Thoracicus *and the inferior* Vena Cava; *by* M. Pecquet. *n.* 85. *p.* 5007.

XXV. 1. The discovery made about 20 Years since by M. *Pecquet* of the *Ductus Thoracicus*, seem'd not sufficient to clear up all the Difficulties to be met in the New Opinion, which this Channel hath occasioned, concerning *Sanguification*.

It might be said, among other things, that there appears no Reason why Nature should carry the *Blood* into the *Sub-clavials*, and thence make it descend by the Trunk of the *Vena Cava*, (*A*) unless it be to keep the *Chyle* from entering all at once, and altogether pure, into the *Heart*; and that the Mixture which is made of the *Chyle* with the *Blood* along this way, may dispose the *Chyle*, by a kind of Contagious *Fermentation*, the more easily to receive the *Character* of *Blood* in the *Heart*: But that this might be more conveniently done, the *Ductus Thoracicus* being inserted into that Trunk of the *Vena Cava* which ascends to the *Heart*, because that this way is shorter, and is equally favourable to this Commixture.

It might also be objected, that supposing this Commixture were of Importance, the *Ductus Thoracicus* should communicate with the Inferior Trunk of the *Vena Cava*, as well as with the Superior, to the end that the Moiety of the *Chyle* being mixt with the *Blood* that comes from on high, and the other Moiety with the *Blood* that comes from beneath, (*B*) it might the more easily be *Altered* by this Commixture. And this Objection seem'd the more Rational, because it being very likely that the *Blood*, which returns from the Parts in which it hath received some Impression in penetrating their Porosities, Communicates to the *Chyle* these same Dispositions; there was Reason to desire, that the *Blood* which reascends, might in some degree impress the peculiar *Character* of the inferior Parts, as that which comes from the upper Parts impresses upon it that which belongs to it. (*C*) Add hereunto, that the *Blood* which reascends to the *Heart*, must be more perfect than that which descends; because it comes from being purify'd in the *Liver*, *Spleen*, and *Kidneys*; so that it is capable to give (*D*) to the *Chyle* good Impressions. (*E*) Lastly, it might be said, that, supposing it be necessary that not only a Proportion of the *Chyle* pass through the *Heart*, to give it some kind of Refreshment, but also that all the *Chyle* be convey'd thither for to be converted into *Blood*; the small Orifices, which the *Ductus Thoracicus* hath in the *Sub-clavials*, seem not to be large enough for that purpose.

The Observations that have been lately made, by searching carefully the Passage of the *Ductus Thoracicus* in the Body of a Woman, did shew, that

these Difficulties were well grounded. For, it hath been found by divers Experiments, made about this matter, that there Ascends at least so much *Chyle* through the Trunk which is beneath the *Heart*, as there descends through that which is above it.

Vid. Sup. Sect. XXIV. These Experiments confirm those which were made some Years ago: And are clearer and ampler than the former. For the *Communication* which the first time appear'd to be only with the *Left Emulgent Vein*, hath been found this second time not only with this *Vein*, but also with the two *Lumbary Veins*, which are inserted in the Trunk of the Inferior *Vena Cava*. The manner of finding this *Communication* was thus; After there had been shew'd the *Commerce* of the *Ductus Thoracicus* with the *Right Ventricle* of the *Heart*, by an Injection of *Milk*, which having been Syring'd into the beginnig of this Channel, issued in great quantity through this *Ventricle*; we ty'd the Trunk of the *Vena Cava* above the *Heart*, so that nothing might pass that way; and the Trunk of the *Emulgent* and that of the *Vena Cava* having been open'd above, longwise, some *Milk* ready to boyl, was (*G*) injected into the *Emulgent* through the *Left Lumbary Vein* (which we have ever observ'd to come from the *Emulgent*,) and at the same time we saw it come away through the other *Lumbary*.

This Experiment having been several times repeated without our being able to see the Track, which we had formerly observed under the *Pleura*; we resolved to attempt a more easie, and more certain Method of discovering this Branch, than the usual Dissection of the Vessels (*H*). This way was to Syringe into the Trunk of the *Ductus Thoracicus* a Composition that might run into it being Hot, and which by being Refrigerated might become Solid enough to afford a greater facility to follow and trace the Channels, in the Cavity of which it should be thus harden'd. And this Design succeeded in part: For the Composition fill'd the whole *Ductus Thoracicus*, and ascended as far as into the *Sub-clavial*; but there passed nothing into the Channel that makes the Communication sought for, though care was had to warm the ambient Parts by several Injections of warm Milk, to the end that the Composition might not harden before it had penetrated into all the Conduits: We also tryed to inject the same Composition through the *Lumbary* that issues out of the Trunk, if its *Valves* would permit it; but they stopp'd all that we endeavour'd to make pass that way, and neither the Milk nor the Wind would ever enter there. (*I*) by this Contrivance we very distinctly saw the Figure and the whole Structure of the *Ductus Thoracicus*, and we found, *that* that *Ductus* did ascend unto the Right Side of the *Heart*, keeping one and the same size, which was no more than $\frac{1}{12}$ of an Inch; *that* afterwards it was enlarged to $\frac{1}{6}$ of an Inch in *Diameter*; *that* in this enlargement its Tunicle on the Right Side of the *Vertebræ* was, as 'twere, pierc'd by 4 small Holes, distant $\frac{1}{12}$ of an Inch from one another, and all disposed in a Row: into which Holes the said Composition had not been able to penetrate; *that* the same *Ductus*, after having re-taken its first Size, had two Appendixes fashion'd like Sacks; *that* there was yet a 3*d*. Appendix beneath the Dilatation; *that* the first and highest Appendix was of the form

form and bigneſs of a ſmall *Phaſeolus*; *that* the 3*d*, which was beneath the Dilatation, was like to the 2*d*; *that* they had a ſtreight Orifice; and *that* the laſt was full of *Chyle*, conſpiſate, ſo that the Compoſition could not enter there, as it had done into the other.

2. *A*, This Reaſon for inſerting of the Trunk of the *Ductus Thoracicus* into one place alone, is as good as any that are afterwards given to prove the contrary. For all Proofs of this Nature are but looſe Conjectures at beſt: the Matter admitting of no other Demonſtration than what is *Ocular*.

Annotations by Dr. Needham Ib.

B, Till the Lower Inſertion be ſhewed, we are bound to believe, that Nature thought the ſingle Commixture of *Blood* and *Chyle* ſufficient. The re-inforcement of that Objection anſwers itſelf, being propoſed in no other Terms than (*it ſeems very likely*;) the whole Conjecture having yet but very ſlender Foundation in Philoſophy. And if there be any thing in the Notion of impreſſing *Characters*, it is more attributable to the *Lympha*. See beneath at *D*.

C, That the *Blood* which re-aſcends to the *Heart*, is purer than what deſcends from the *Head*, &c. is a Notion that will not eaſily be granted: neither can it be made out by Experiment. I have my ſelf compared the *Blood* of the *Jugular Vein* with that of the *Crural* in a Dog, and found no difference. The Separations made by the *Kidneys* and *Liver* (if they prove any thing) prove the Aſcending *Blood* to be thicker than the Deſcending; it having loſt in thoſe places much of its *Serum* and *Lixivial Salts*, which are the great Inſtruments of Attenuation. But withal it is to be conſider'd, that the *Blood* which Aſcends from the *Heart* to the *Head*, parts with much Excrement in the *Glandulæ Salivales*, and Noſtrils, and the whole Throat; the Quantities of which are much greater than will eaſily be imagined. There is likewiſe a great Separation made in the *Brain*; which whether it be of the Pureſt and beſt *Spirits* of the *Blood*, ſo as to leave it depauperated; or only of a *Nutritious Serum*, ſuch as is made in all the Solid Parts, is hard to ſay. Only this may be certainly ſaid, that the *Lympha* does wholly exonerate itſelf into the *Sub-clavial* and *Jugular Veins* near the place of the Inſertion of the *Chyle*; whereby the whole *Chyle* is diluted, and the Mixture of it and the *Blood* facilitated. Which very *Phænomenon* is a greater Argument to prove, that the *Chyle* does wholly enter by that Paſſage, than any can be produced on the other ſide. For we ſee, all the *Lympha*, not only of the *Liver* and *Inteſtines*, but alſo of the *Lower Limbs*, to pour it ſelf into the *Receptaculum Chyli*, and not into any of the Lower *Veins*: Whereas the *Lymphaticks* of the *Head*, *Neck* and *Arms*, think it ſufficient to meet the *Chyle* at the place of its entrance, which ſame thing might have been done by the Lower *Lymphaticks*, had they any *Chyle* to meet: The principal uſe of the *Lympha* ſeeming to be, to ſerve the Uſes of the *Chyle* and its Mixture with the *Blood*.

D, What *Impreſſions* are made on the *Blood* by the *Liver*, *Spleen*, *Kidneys*, &c. is uncertain: but if there be any ſuch made, the *Liver* and *Kidneys* do ſo readily exonerate themſelves into the *Vena Cava*, that the *Impreſſions*, be they

they what they will, are quickly convey'd to the *Heart* without any great Diminution of them. And whereas the Author mentions the *Characters Impreſſed* from Parts, thoſe, (if any ſuch be) may more juſtly be ſuppoſed to be convey'd in the *Lympha*, which Liquor ſeems to be a Product of thoſe Parts curiouſly elaborated in the very Subſtance of them.

E, What is ſufficient and not ſufficient, muſt be judged of by Nature, and not by us. Yet if we conſider the time that is ſpent in carrying the *Chyle* up into the *Blood*, it is eaſie to believe, that a much greater Quantity of Liquor may be diſcharg'd by that *Ductus*, than is uſually pretended to.

Vid. Sup. Sect. XXIV.

F, What thoſe Experiments are, we ſhould be glad to know. But the Experiment of 1667. (if I rightly remember it) was only a *Luſus Naturæ*, found by M. *Pecquet*; which I therefore call ſo, becauſe neither he, nor any one elſe hath found it ſince. Whereas the *Vaſa Lactea*, and the ways of ordering them, are ſo well known, that if any ſuch thing were, it could not long be hid.

G, An Injection into the *Lumbary Vein*, with its Effects mentioned, can prove nothing but the *Inoſculatio* of the two *Lumbary Veins* with each other: which is acknowledged to be ſuch in all the *Capillary* Veſſels of the ſame kind, *viz. Veins* with *Veins*, and *Arteries* with *Arteries*. But the thing requir'd here is, the paſſage from the *Receptaculum* to the *Lumbary Vein*, or to any other *Vein* beſides the *Subclavial*.

H, The way of Syringing a Liquor which is apt to *Coagulation*, into the *Ductus Thoracicus*, &c. I think to be needleſs and unprofitable as to this Inquiry, when there is a more eaſie Experiment to be made, which is more Demonſtrative, *viz.* open a Dog at a convenient diſtance of time from his Feeding, and then tye a Ligature upon the *Ductus Thoracicus* nigh the *Subclavial*: your *Receptaculum Chyli* will continue full 48 *Hours*, or longer if you pleaſe: So that if there be any ſuch *Ductus*, it muſt remain likewiſe full with its own natural Liquor, and be all that while Viſible. But if there were any ſuch *Ductus*, it would in a quarter of the time empty the whole *Receptacle*; whereas upon a Ligature you'll find the clean contrary, *viz.* all the *Lacteal Veſſels* (that are acknowledg'd to be ſuch) fully diſtended, Which is a full Demonſtration, that they have no way of Evacuation by any other *Duct* than the *Thoracique*.

I, The other Uſe of the *Coagulating Injection* I applaud; though the ſame may be done by the Ligature aboveſaid. However the Event of the Experiment, made by the Learn'd *Pecquet*, makes againſt the Opinion of a *new Ductus*, and not for it.

The true Uſe of the Lympha-tick-Veſſels; by M. Louys de Bills. n. 40. p. 791.

XXVI. The *Lymphatick Veſſels* have two *Coats*, betwixt which there are innumerable very ſmall and very fine Filaments, reſembling the Moſſe of Trees, without any *Valves*, containing a *Nutritious* Juice convey'd into all the Parts of the Body, by a Motion thereof from the Center to the Circumference; but returning through the inner Pipes (furniſht with *Valves*,) of the ſame *Water-Veſſels*; at which time they are no more to be call'd *Water* or *Dew*, but *Ferment*, the Veſſels deſerving alſo the Name of *Ferment-Veſſels*.

This

This *Ferment* ſerves to keep the *Blood*, and to *Ferment* the ſame, being convey'd into it by a Motion contrary to the former, *viz.* from the Circumference to the Center; which I have ſhewed to many in the *Jugular Glandules* taken out of a Dog; wherein I ſhew'd them, that theſe *Lymphatick Veſſels* carry their *Dewy* Particles about the *Glandules*, between the two *Tunicles*, and that in the lowermoſt end of theſe *Glandules* the *Ferment-Veſſel* takes its beginning, being enclos'd in theſe *Dewy Veſſels*, and ſo conſtituting the inner Pipe together with the *Valves*, which are of another Form, than hath been known hitherto.

To your *Quære*, Whether the ſaid *Ferment-Veſſels* diſcharge at laſt all their *Ferment* into the *Ductus Thoracicus*, thence to be carry'd directly into the *Heart*, there to increaſe and to *Ferment* the *Blood*; or whether they communicate their *Ferment* to other Parts alſo? I anſwer, that moſt of the Juice of the *Milky-Veſſels* is diſcharged between the *Tunicles* of the *Veins*, *Arteries*, *Lymphaticks*, *Membrans*, and the *Veſſels* in the *Meſentery*, to be convey'd into all the Parts of the Body, both Internal and External. For even in *Bearing-Females* the *Fruit* is not nouriſh'd by any *Blood*, but by the *Nutritious Juice* convey'd to it; as alſo by the *Moiſture* contain'd in the *Amnion*, which is no *Urine* nor *Sweat*, as ſome imagine; we having lately ſeen in the Houſe of Dr. *Stalpart* at the *Hague*, in a new born *Child*, that his *Urachus* had no Cavity at all, through which the *Urine* could paſs out of the *Bladder* into the *Amnion*. The remaining and leaſt part of the *Liquor* of the *Milky-Veſſels* is tranſmitted through the *Ductus Thoracicus* by the *Jugular Vein* into the *Blood*.

Beſides theſe *Veſſels*, there are yet others that do not Exonerate themſelves into the *Blood*, *viz.* the *Ductus Virſungianus*, which delivers it ſelf into the *Duodenum*; and the *Ductus Salivales*, whereof the *Saliva* does no leſs, than the *Juice* in the *Ductus Virſungianus*, ſerve for *Ferment*, *viz.* the one in the *Stomach*, and the other in the *Inteſtines*. From whence you may eaſily conclude, not that I hold (as it ſeems I have been underſtood) that the leaſt part in the *Ferment-Veſſels* concurs to the making of *Blood*, but that the leaſt part of the *Juice* in the *Milky Veſſels* is diſcharged into the *Blood*.

Concerning the other *Quære*, Whether alſo the Diſtribution of this *Ferment* is made through the *Teſticles*, *Kidneys*, *Breaſts* and *Salival Glanduls*, &c. I anſwer, That the *Salival Glanduls* carry their *Spittle*, or *Ferment* into the Mouth; and that the reſt which returns back through the *Teſticles*, *Breaſts*, and other *Glandules*, is carry'd to the *Ciſtern*.

XXVII. Vir. erat quaſi 35 Annorum, Robuſtus, Temperamenti *Bilioſi*, qui Decimis colligendis eo tempore occupatus, poſt Operam Laborioſiorem Poros forſan cito nimis ex Rigore admiſſo occluſerat. Prima ergo Morbi invaſione *Febrificavit*, primo, Rigore & Horrore, dein Calore, & *Doloribus* vagis, (nunc in *Ventriculo* & *Inteſtinis*, mox in *Pectore* ſævientibus) correptus. Verum hæc *Symptomata* cum aliis brevi permutantur; Materia enim Morbum committens ſe in Dorſo omnem depoſuit: Hinc immanis *Lumborum Dolor* ad *Coxendicem* uſque ſæviens; Et quidem tantus erat *Dolor*, ut ſudores Sympto-

A Convulſive Rheumatiſm; *by Dr.* Rob. Pitt. *n.* 208. *p.* 58.

Syptomaticos ſic expreſſerit, ut a Capillis & Facie Guttæ catervatim ſtillarent. Præ *Dolore* neque in Lecto procumbere, nec erectus ſtare, nec in Sedili ſedere, potuit: Verum *Abdomine* ad Spondam Pedum fulcris protruſo, *Dolorem Lumborum* compreſſione illâ aliquo modo fallere videbatur. Sed neque ſic inclinato Corpore quietus (ut voluit) perſtare uſque potuit: Sed *Convulſionibus* correptus primò erigebatur, cum Vultu miſerabili, & ringenti Ore, dein in Humum retorquebatur (niſi adſtaret aliquis qui Caſum ejus præveniret) ubi immotus Cadaveris inſtar manebat, ſeſe movere inhabilis, neque majori ad ſurgendum potentiâ donatus, quam ſi eſſet Infans. Brachia etiam & Crura ei proſtrato rigebant, ut nullo modo extendi retrahive poſſent. Os etiam *Convulſionibus* ita claudebatur, ut Cochleare vix admitteret. *Convulſiones* autem illæ, quibus Membra & Dorſum corripiebantur, per *Paroxyſmos* redibant; non quidem Periodicos, ſed nunc citiùs nunc ſeriùs redeuntes prout *Dolor* magis minuſve ſæviret. Sed eum ad poſitionem ſuam optatam, Spondam *ſc.* reducamus, ubi Vultu ita erat Compoſito, qui Riſum ſane cuiquam videnti facilè moveret, niſi Recordatio earum quas ſuſtinebat miſeriarum Miſericordiam potiùs excitaret. Sic autem Dies Noctesque Miſellus Homo tres plus minùs Septimanas tranſigebat, nunquam in Lecto diſcumbens, Inſomnis ut plurimum, cum *Dolore* ſummo, crebriſque *Convulſionibus*. Hæc ſunt quæ in eo obſervare potui *Symptomata*; cætera ſanus. Nulla erat *Vomituritio*, Pulſus fortis & æqualis; Lingua humida, & Pelliculâ albâ obducta; Sanguis per Venæ-Sectionem eductus, Sanguini *Pleuriticorum* ſimilis; Urina ut Sanorum. Quid per primam ſeptimanam factum ſit, neſcio; niſi quod Vena ſemel pertunderetur; ſemel Clyſter, & ſemel purgans Medicamentum adminiſtrarentur; & Vis ſatis magna *Laudani* ſine Fructu exhiberetur. Sed incaſsùm hæc omnia. Tandem me accerſi curant, qui cum Ægram vidiſſem eo quo ſcripſi modo laborantem *Venæ-Sectionem* repeti jubeo, ad ſatis largam Quantitatem. Die proximo *Lenitivum* præſcripſi, quod dum per ſedem ad ʒ 4ve Vires operabatur, Æger *Rectus* obambulare potuit, nullis *Doloribus*, nec *Convulſionibus* laceſſitus; quo tandem ſuo munere perfuncto, redeunt ſtatim *Dolores* & *Convulſiones*, & ipſe ad priſtinam ſuam ſtationem Spondam *ſc.* redit. Hoc tamen Animos addidit, *Purgationes* repetitas rem ipſam expedire poſſe, cum primum *Purgans* eas à Morbo Inducias daret. Die ergo ſequenti *Reſinam Jalapii* & *Mercurium dulcem* exhibui (cum expertus eſſem quid in *Lumborum Dolore* valeret hoc Medicamentum) ſed præter Spem, ne ſemel quidem Depoſuit Æger, quamquam ʒj. Syr. è *Spin Cervinâ* adjecerim. Ut ergo duro huic nodo durum ſatis adaptarem Cuneum, *Purgantium* Doſin auxi, *Syr. è Spin. Cervin.* ad ʒ *iij.* ʒ *iiijve* alternis diebus adhibens. Sic tandem Alvus aperta eſt, & *Dolores* mitigare, & *Convulſiones* non ita crebro laceſſere. *Serum Lactis* ut ad libitum hauriret permiſi: Et cum Alvus *Purgantibus* reſponderet, *Laudanum* tutiùs & liberiùs exhibere potui, unde Requiem Spiritibus, à Morbo ſimul & Medicamentis exagitatis, conciliarem; nec tamen Materiam Morbum committentem ab eo incarcerarem. Sic tandem factum eſt ut à repetitis his *Purgantibus*, octo puto, aut decem, evanuit *Dolor*, & *Convulſiones* ceſſarunt, & ipſe ſartus tectus valet. Ego interim ut à *Recidiva* caverem, Nervina Medicamenta, quæ Sanguini & Spiritibus Vigorem imprimerent, adhibens;

bens; Eum vigetum vividumque & Onera Humeris sustinentem, nuper vidi. E memoria fere excidebat, Suras ei convalescenti intumuisse, qui Tumor his ultimis Medicamentis facilè cessit.

XXVIII. Dr. *Baynard* was always of Opinion, that the *Pains* in a *Rheumatism* were not caused from any *Saline* or *Acid* Particles in the *Blood*, &c. but rather from the *Clammineſs* and *Denſity* extending the Channels through which it passes, which Extension produces those Sharp and Pungent *Pains*, which *Rheumatismatick* Persons so generally complain of. For although the proper *Coats* of the *Veins* and *Arteries*, seem to be *Indolent* in themselves, yet those thin *Membranes* which obside them are most exquisite of *Sense*, and full of *Lymphæ-ducts*, which being dilated and stretch'd cause an *Inflammatory Symptomatical Fever*, with continual *Sweats*; the *Blood* being *Glutinous* and *Siezy*, as in *Quinsies* and *Pleurisies*, and all other *Inflammatory* Distempers. The *Fever* being increased by the great store of *Alkalial Corrosive Salts* lodging in the *Blood*, causing Thirst, *&c.* and not diluted and washed off by *Urine*, which *Urine* is always thick, turbid, and high-colour'd, and almost, if not totally, devoid of any *Saline* Impregnations. To prove which, he sent 6 *Quarts* of a strong Man's *Urine*, in the heighth of a *Rheumatism*, to that Ingenious Artist Mr *George Moult*, who Chymically Anatomiz'd it, and found not above the 30*th* part of those *Salts*, usually found in such a Quantity of the *Urine* of a *Sound* Person.

The troublable Causes of the Pain *in* Rheumatisms; *by Dr.* Edw. Baynard. *n.* 215. *p.* 19.

XXIX. Sit *A B*, Cylinder æneus Concavus, idoneæ Crassitudinis, cujus Diameter sit unius, Longitudo verò decem aut 12 *Unciarum*; parsque interna exquisitissimè lævigata, ut nimirum nulla Rimula remaneat; sitque ei prope fundum, parvulum Foramen *O*; porò sit Operculum E *F*, (*Fig.* 67.) Fundus *G H*, (*Fig* 68.) illud duabus Cochleis, hic Cemento Metallico Cylindro nexus; adsit Fundo Nasus 1, 2, medio perforatus, & ejusdem parti externæ, ad modum Cochleæ, fiat Virga ferrea *N N*, (*Fig.* 69.) idoneæ Crassitudinis, & Longitudini Cylindri adaptata; ad ejusdem extremitatem Lamina Ænea *L M*, & propinquiùs duabus *Unciis* Cacumini altera *I K*; spatiumque intermedium ita Fil s Linteis Oleo madefactis replendum est, ut perfectissime cavitatem Cylindri claudat; adsit tandem Manubrium *N*. Ex his partibus complexum haud dissimile est *Syringæ* Chirurgorum. Formetur etiam Cylinder Æneus *O P Q R*, (*Fig.* 70.) magnitudinem Figuræ adæquans, duabus Alis *O S*, *P S*, per Axem perforatus tam magno foramine, ut ejusdem pars interna formâ Cochleæ Feminæ modificata, accuratè Cochleam Marem Nasi recipiat; porrò augeatur Foramen ab *R*, & *Q*, usque ad *T T*; tandemque fiat Humerus *V V*, & formetur Lamina *W*, medio perforata, ut ei (Humero) conveniat & adhæreat. Porro formetur Conulus rectus, per Axem perforatus 1, 2, 3. (*Fig.* 71.) augeaturque foramen ab 1, 2, usque ad 4, 4; formeturque Humerus 5, 5, ut exquisitissimè conveniat cavitati Cylindri *T*, *T*, & ei strenuè adhæreat fiatque tandem Elater (*Fig.* 72.) ex filo Æneo Helicis formâ circa Cylindrum, idoneæ Viris, & Pixidis 4, 4, *V*, *V*, Diametrum ferè adæquans, sed Pixide aliquanto altius, cùm sibi relinquitur;

The Pneumatick *Engine apply'd to* Cupping-Glasses; *by Mr.* Tho. Luffkin. *n.* 255. *p.* 288. *n.* 259. *p.* 408.
Fig. 66.
Fig. 67.
Fig. 68.
Fig. 69.
Fig. 70.
Fig. 71.
Fig. 72.

habeat ad extremitatem infimam Laminam 7, 7, ejuſdem magnitudinis, cum pars infima Corio molli Oleo armato veſtienda eſt, ad occludendum Orificium Canalis. Iterum fiat ad Verticem *Cucurbitulæ*, (*Fig.* 73.) perforatio rotunda, quâ immérgatur Conus uſque ad Alas S S; & Rimulæ aut Fiſſuræ repleantur Cemento, ex Reſina Terebinthina & Calce compoſito. Tandemque fiat Operculum 6, 7, 6, 7, (*Fig.* 74.) ad Humerum 7, 7, Corio Oleo madefacto veſtitum, quo Aër quam primum ex Vitro hauſtus erit (ſi Fiſſuræ utut parvulæ Valvulâ forte remanebunt) excludi poteſt. Hucuſque in ejuſdem Deſcriptione tempus trivi: nunc non de Uſu & ad Morboſos Applicatione, quia Medicorum & Chirurgorum eſt; ſed Uſus ratione, pauca ſubnectam. Cum Pollex ſtrenuè applicatur ad Foramen, & Lamina 9, 9, (*Fig.* 75.) Manubrio attollitur ad 10, 10; at quia Aër antea tantum ſpatium 9, 0, 9, replevit, nunc ita Rarefactus aut Expanſus eſt ut ſpatium 9, 9, 10, 10, (hoc eſt tricenties majus) occupat, quapropter Aëris Vitro incluſi Elaſticitas, Elaſticitates Elateris & Aëris Cylindro contenti ſuperans, ſurſum obtrudetur Lamina, aut Valvula, quæ aperta remanebit donec tanta Quantitas Aëris petit Cylindrum ex Vitro, ut complementi Aëris Vitro Elaſticitas fiat equalis Elaſticitatibus Elateris & Aëris nunc Cylindro contenti; ac aperto Foramine o, Aëris externi preſſurâ potenter occluditur valvula 1. Cæteris paribus, & tribus quatuorve Suctionibus plus minuſve $\frac{999}{1000}$ Aëris (ſecundum Elateris poteſtatem; & rationem quam habet Capacitas Cylindri ad Capacitatem *Cucurbitulæ*) exhauſtæ erunt: Et ſi Elaſticitas *Aeris* eodem ſpatio ſit ut Quantitas, Reſiſtentia aut Preſſura ſub Vitro erit ad preſſuram ſupra partes circumjacentes, ut Unitas ad mille; quia antequam Aër exhauſtùs erat Vitro, Reſiſtentia aut Preſſura ſub Vitro eadem fuit cum illa ſupra partes extra Vitrum. Notatu dignum exiſtimo, ut quanto major erit Cylinder eodem Elatere, tanto major *Aeris* Quantitas exhauſta erit Vitro; quia Aër 9, 0, 9, in majus ſpatium extenditur, & conſequenter minorem habet Elaſticitatem; quapropter majorem habebit rationem Elaſticitas *Aeris* in Vitro ad Elaſticitatem *Aëris* in Cylindro & Elatere contenti, itaque major *Aëris* Quantitas Vitro extrudetur.

Fig. 73.

Fig. 74.

Fig. 75.

The Operation *of a* Blifter *when it Cures a* Fever; *by Dr.* William Cockburn. *n.* 252. *p.* 161.

XXX. There is hardly any one who has not ſeen a *Bliſtering* Plaiſter, the great Ingredient whereof are *Cantharides* laid upon a fleſhy Part, and after ſometime, obſerved the *Scarf-skin* forced up with a Liquor, that Ooſed and Iſſued out from within the Sphere of Activity of that Plaiſter: And if we conſult the moſt of *Phyſick* Books the Account is no better. Little or nothing more is ſaid, even by Authors of the firſt Form, than any one may obſerve every Day; ſuppoſing only that he thinks, that our Fleſh, thus covered at any time with a *Bliſter*, is made up of many and divers Veſſels, out of which the diſcharged Water may come. I have therefore endeavour'd to find a Reaſonable Account: *How the Raiſing of a Bliſter may Cure a Fever and its moſt terrible* Symptom *the* Delirium, *and that in* 6, 8, *or* 10 *Hours.*

To this end, I *firſt* employ'd *Microſcopes* to look on the *Fly*, and its Powder; and to ſee if I could diſcover any *Sharp Inſtruments* in theſe Warlike and Wounding Creatures. But the *Fly* became a very delightful, but too large a

Survey

Survey for me; and the Powder begot nothing formy Sight but a dark Cloud; and whatſoever elſe I found, I could meet with no *Arms.* I then turn'd halt a *Pound* of *Cantharides* into a *Retort*, and there came over with the leaſt Sand-heat, and in a very ſhort time, vaſt Quantities of Bodies ſo very ſmall, that I was not able to diſcern their Shape. And though I proceeded in the uſual way, on the like Occaſions, the whole Operation was perform'd very *ſcon*; and ſo *haſtily*, that very little *Salt* ſtuck to the Neck of the *Retort*, and the *Volatile Salt* ſhot in moſt delightful *Chryſtals* in the *Receiver:* And of the whole 8 *Ounces* of *Cantharides*, there were only two *Ounces* and 5 *Drams* left as a *Caput Mortuum* in the *Retort.* When the *Liquor* came to be Purify'd, the ſmalleſt Heat brought it over ſuddenly, *Oyl*, *Salt* and *Spirit*; ſo that they could not be parted, till by a repeated Operation with *Brick-duſt.* I mix'd the *Spirit* with *Salt* of *Wormwood*, *Spirit* of *Harts-horn* and *Sal Armoniack*: But it did not *Ferment*, contrary to the Expectation of moſt Authors. Then I turn'd it over upon *Spirit* of *Vitriol*, where it did *Ferment* very ſtrongly, and yet better with *Spirit* of *Nitre*; with which alſo I did mix the *Spirits* of *Sal Armoniack* and *Harts-horn*; but they neither *Fermented* ſo long, nor with ſo great an *Ebullition:* from whence 'tis evident, that it is not only *Alkaline*, but a great deal more than any one of theſe I have now mention'd.

The *Internal Uſe* of theſe *Flies* in Phyſick, having been lately Controverted with much Heat, I ſhall here give ſome *Hints* whereby to ſtate the Queſtion fairly; and ſuch as if uſed as Topicks in the Controverſy will ſoon put an end to it among Thinking and Sober People. The great thing Challeng'd is this, That we may ſee *Cantharides*, which have been reputed *Poyſon*, now ſo *Corrected*, that they become not only Innocent, but prodigious Inſtruments of Health. For the clearing of this, firſt ſettle what a *Poyſon* is; and next, ſince *Death*, or no *Circulation* of the *Blood*, is its Conſequence, we muſt find as many Kinds of *Poyſons*, and ways of *Dying* Natural, as there are ways of ſtopping the *Blood's Motion* in the Courſe of Nature or by Medicine; which is either, by its own *Rarefaction* to a Degree, its *Coagulation*, or laſtly by *Letting it out* in ſuch a Quantity that the remaining part gives not Animal *Actions*; and as all, or any of theſe, may be *ſudden* or produce their Effects in *Time*, we ſhall have *Evident Poyſoning* or *Poyſoning* for a *Time*; of which we have many Hiſtories. Again, it may be askt, of which of all thoſe *Cantharides* are? and of all I believe they may be found entirely or moſt eſpecially of the 3*d* ſort. After this we ſhall be led naturally to enquire, if they be *Corrected*, or in plain Engliſh if they have left their *Wounding Power*; and this is the Fact, of which we may inform our ſelves, by applying a *Plaiſter* of *Cantharides* ſo *Corrected*, to a place expoſed to *Air*. This will ſettle the Fact of *Correction*, and in Circumſtances much to the advantage of the *Correcting* ſide, becauſe there the *Skin* and *Veſſels* are much Harder, than thoſe to be met with within the Body; and if they *Bliſter* then, much more when *Internally* given. The poſſibility of their being *Corrected*, and of their becoming uſeful, may not be doubted of: But then it is our Reaſon, in this way, that muſt be judge. Add to all this the common Obſer-

vation, that a common *Bliſter* ſometimes makes *Bloody-Urine*, and compute what Quantities enter the *Plaiſter*; and then what Quantities of ſmall parts may be ſent from them that are thus mix'd; next Calculate what probable Diſtribution may be made of theſe parts to the *Kidney*; and then you'll find that Parts that are nearer, and as ſuſceptible, muſt be *Wounded* too, and produce all the ill Effects that are ſuppos'd and commonly ſeen. But if all this can happen by ſo ſmall a Quantity of the *Powder* that goes to the *Plaiſter*, and is confin'd by other *Viſcid* Ingredients of it, what can be the Conſequence of this *Powder* when it is taken inwardly, and in ſubſtance? But it is *Corrected*; and we are told with *Camphir*. The moſt unfit *Corrector*; ſo far as I can expect in Reaſon, or even imagine. But ſtill our Reaſon may be frail; and ſo it may, and really is ſo, to a great Degree. But then to help it, I had two *Plaiſters* apply'd, each of them with *Cantharides*, and one of them with as much *Camphire* as *Cantharides*. The next Morning, we found that *Plaiſter* wherein the *Cantharides* were mixt with *Camphire*, to have quite as good Effects as the other where there was none. The Conſequence of which is, that if *Cantharides* ſaid to be *Corrected* make a *Bliſter*, when apply'd to any External Part of the Body; that they are to be thought not to be *Corrected*.

But leaving theſe Particulars, I ſhall proceed to prove the way of a *Bliſter*'s working when it *Cures* a *Dilirium*, and a *Fever*. And here I ſhall only ſuppoſe.

1. That there are very *Mobile*, or *Volatile* parts in *Cantharides*, &c. that can be determined into our *Fleſh*, with a Force ſufficient to make their way thorow the ſides of any *Veſſels* that are in the *Lines* of their *Direction*, ſo long and in that proportion that their *Impreſſed Motion* does continue.

2. That all ſorts of *Fluid Bodies* contain'd in the Cavities and Channels of theſe Veſſels, may be tranſmitted, according to the Conditions of Separation of *Fluid Bodies* running in Veſſels of that ſort, and the Wideneſs of the *Emiſſaries* made by the *Wounding* Particles of *Cantharides*, or any ſuch like *Bliſtering* Subſtance.

Next I ſhould proceed to make ſome Suppoſitions, from the Nature of a *Fever* and a *Dilirium*: But that I may be better underſtood, I ſhall firſt Hint ſome general things about them.

Fevers in reſpect of time, either remain after the ſame manner, from the Sickening till the Sick Perſon is freed of his Diſeaſe, or not: If the firſt, they are call'd *continu'd Fevers*; but if the Sick Perſon continues evidently in a ſickly way, and yet has great Reliefs, and is reſpited from his Illneſs for a time, the *Fever* is ſaid to *Intermit*, or that it is *Intermitting*. Theſe Diſeaſes are perfectly well diſcover'd by the *Quickneſs* of the *Pulſe* which is the fault of the *Pulſe*, and the *Pulſe* cannot be ſo but by the *Faultineſs* of the *Blood*, either in *Quantity*, *Quality*, or its *Motion*: Neither can it offend either in *Quantity*, or in *Quality*, but it affects its *Motion*. Hence we may ſuppoſe that a *Fever* is an univerſally Heighten'd *Circulation* of the *Blood*, and that a *Delirium*, *h. e.* that Unconnected, Incoherent, and Ridiculous way of Imagination and Expreſſing our ſelves in a *Fever*, is entirely the Effect of this greater *Motion*.

Theſe

Theſe things being ſuppoſed, the Queſtion may be Stated thus; How *Wounding* by *Cantharides* makes our *Pulſe* not ſo *Quick*, and conſequently our *Blood* to have a more Slow and Natural *Motion*? That this great *Effect* does not proceed from the *Pain* of a *Bliſter* is Evident; becauſe *Pain* very often brings a *Fever*. That the Particles of the *Cantharides*, mixt with the *Blood*, ſhould induce this Quiet by a peculiar ſort of *Fermentation* they make in the *Blood* is very precarious; For I have ſhown in another place, from Hints of an Eminent *Member* of the *Royal Society*, and perhaps the greateſt *Chymiſt* that ever lived, that there is no ſuch thing as a *Chymical Fermentation* in our *Blood*. And the Quantity of *Lympha* that is thereby ſeparated from the *Blood*, is acknowledg'd by moſt Phyſicians to be too weak a Cauſe for ſo great an *Effect*. I ſhall therefore proceed to enquire after a better *Solution* of this aſtoniſhing *Phænomenon*.

Vid. Sea-ſickneſſes; *Part* 1. *p.* 47.

The *Pulſe* is nothing but the ſide of an *Artery* that is diſtended by a certain Quantity of *Blood* that is determined thorow it's Cavity, by a certain *Motion* every time the *Heart* is *Contracted*, and that touches and Beats up our Finger, when we lay it on a place where we may be ſenſible of this Affection in the *Artery*. We ſay this *Pulſe* is more *frequent*, not ſo much that it Beats *oftner* than any other Bodies, but that it Beats *quicker* in the ſame Perſon when he is ſaid to have a *Fever* than before, when he was reputed to be in perfect *Health*; ſo that a *Phyſician* is obliged to know the *Natural Pulſe* of every Perſon, before he can judge by the *Pulſe*, that any one is *Sick*. And how that may be done I have ſhewed at length, in a Book, ſometime ago. Howſoever in this our Caſe, the *Pulſe* is *quicker*, and there is no *Pulſe*, but when the *Heart* is *contracted*; and the *Heart* being a *Muſcle*, and *Contracted* at every *Pulſe*, is either the chief or only *Cauſe* that Determines and ſtretches the ſides of *Arteries*, and makes a *Pulſe*; or a very extraordinary meaſure of ſuch *Diſtenſions*: But it has the greateſt ſhare in Propelling the *Blood* round the whole Body, in reſpect of the Help of the *Arteries*, which they are ſuppos'd to give by their *Reſtitution*, after their extraordinary *Diſtenſion*. Be it how it will, both their Actions are by *Contraction*; (tho' afterwards I take no notice of that of the *Arteries*) and no *Contraction* in *Muſcles* was ever ſuppoſed by any ſober Man to be perform'd, but by an Influx of *Spirits* into the Fibres of the *Muſcles* ſo *Contracted*. So that now our Queſtion changes thus, How *Wounding* by *Cantharides* makes the *Contraction* of our *Heart* weaker?

The *Contraction* of *Muſcles*, and conſequntly of the *Heart*, being by the *Spirits* that flow into them, as I have ſaid before; therefore whatſoever weakens the *Contraction* of any *Muſcle*, (ſuppoſe the *Heart*,) muſt either be ſuch a thing that can hinder the *Separation* of theſe *Spirits*, or intercept them in their Channel of *Conveyance* to that *Muſcle*, after they are ſeparated. The *Spirits* are known, by *Anatomical Experiments*, to be ſeparated from the *Blood* in the *Brain*: now, whatſoever hinders the *Separation* of the *Spirits* from the *Blood*, muſt either hinder that Rarefaction of the *Blood*, that comes by being broke down into ſmall parts, and makes them *Spirits* in their proper place, or the *Blood* of that fineneſs that is neceſſary for it to be perſpired; *h. e.* a Body that affects the *Blood* ſo as not to *Separate Spirits*, muſt

be

be of a Nature to make its parts more *Compact* in their *Contact*; to have their *Contact* with a greater *Nisus*, and consequently to have its Parts less *Separable*. The next way is by affecting its *Motion* so that it discharges great Quantities out of the *Blood*; by these means the Quantity of *Blood* being lesser, it gives fewer *Spirits*, when it is broke down; and is not so capable to be so Comminuted, because of the parts of *Blood* not Pressing so much one upon the other, in the whole Course and Time of *Circulation*. Or, Thirdly, by some means that Affect the Parts that transmit these *Spirits*, so, that now no *Spirits* can be *Separated*, or in a smaller Quantity.

If we apply the *Wounding* by *Cantharides*, or its *Effects*, to all these ways, we shall find that in the *first* Consideration, the *Lympha* separated in a *Blister* is nothing at all concern'd, and that the Stupendous Effect might possibly be produced without any such Discharge. But if you go further, and suppose the *Cantharides* got into the Mass of the *Blood*, without any gathering of *Waters*, you cannot suppose that the parts of *Cantharides* that are so subtle, so *Alkaline*, and which, by other Experiments, make the *Blood* so *Fluid*, can be any great Enemies to the *Rarefaction* of the *Blood*, which makes *Spirits*, and fits them to be *Separated*; or any considerable Instrument in Lessening the *Rarefaction*, which is requisite and absolutely necessary, by the *first* Condition. Neither are they in their Nature fit Instruments for the 3*d*; besides that, we find no Signs and no Marks of such an Interruption, either in the *Brain* or any where else. The 2d. Condition for hindering so great a *Preparation*, and so great a *Separation* of *Spirits*, is the Effect of all *Evacuations*, So that, by the by, *Evacuation* is the great Indication for the Cure of a *Fever*, and is a great deal more evident than any *supposed Poyson*, or *Malignity supposed* to be discharged, by *supposed Alexipharmicks*, that are *supposed Antidotes*: Yet this Effect by an *Evacuation* is granted, and by the way of working will be found unable to discuss all the *Phænomena*, in doing it in so *short* a time as in the state of our Proposition.

Let us therefore enquire if a *Elister* that makes small *Wounds*, and *Cures* a *Fever* in a *short* time, can produce this its Effect in the only way we have left us; and that is by *Wounding* that *Channel* that carries those *Spirits* that *Contract* the *Heart*, give us a quick *Pulse*, and a *Fever*, with all its Attendants, *Deliriums*, &c. If this Supposition is allowed of, no doubt but that any the least Quantity of *Animal Spirits* let out by such *Wounds*, in a very little time, will proportionably weaken the *Heart's Contraction*, and give us a *slower Pulse*; which is all we want: and which is more, this *slower Contraction*, which is known by our *slower Pulse*, determining the whole *Circulating* Blood with less force, the Parts of *Blood* do not *Comminute* themselves so much as when the Motion was more Rapid; and, by consequence, there is not such a Disposition for *Separating* small parts in the *Brain*, that afterwards they may be Derived thorow the *Nerves* into the *Heart*. But moreover, the lesser Motion continuing for some little time, or 2 or 3 *Minutes*, in a Velocity something like our natural Motion: all the *Secretions*, which are perform'd in such *Degrees* of *Velocity*, will again begin to be done as before.

It

If therefore we can pūt little *Emiſſaries* on the *Nerve*, that is more eſpecially concern'd in the *Heart's Contraction*, we ſhall hinder any *Preparation* in the *Blood* for *Separating* ſo great a Number of *Spirits*; which is one great Requiſite: Nay, we ſhall make *Secretions* of that ſort, and in that way as in time of *Health*; and if there be but *Secretions*, the *Contriting* Parts, and thoſe to be broke down, ſhall have no ſuch a cloſe *Contact*, and therefore that extraordinary Quantity of *Spirits* ſhall not be *Prepared* in the *Blood*; and if they are not *Prepar'd*, they cannot be *Separated* from it; or a *Moderate Quantity* of *Animal Spirits* ſhall be conveyed into the *Muſcular Fibres* of the *Heart*: or again, which is the ſame thing, its *Contraction* ſhall be *Natural*; And all this may be done, or begin to be done, in 2 or 3 *Minutes*.

But How we ſhall Apply a *Bliſter*, that may *Wound* the *Conveying Nerves*, is the only Queſtion that remains. To do this we muſt remember, That the 8th *Pair* of *Nerves*, which ſerves for the *Heart's Contraction*, has its Riſe from the ſides of the *Medulla Oblongata* behind the *Proceſſus Annularis*, by ſeveral Threds which joyn together, and go out by the ſame Hole that the *Sinus Laterales* diſcharge themſelves into the *Jugulars*: And ſince the Union by the *Atlas*, is not ſo firm and compact as in the other *Vertebræ*, it is evident, that there is no extraordinary hindrance, why ſome of theſe *Wounding* parts may not come at that *Nerve*. But if you Reflect again, that this *Nerve*, or conſiderable *Branches* of it, run ſuperficially enough on the *Neck*, you will have leſs difficulty to apprehend how ſome of them are *Wounded*, and to underſtand how theſe Miraculous *Effects* do Happen, and are Produced. Or, it is eaſy to underſtand how the ſmall parts of *Cantharides* can wound the 8th *Pair*, or by *Wounding* its *Branches* derive from the *Nerve* it ſelf, and *Leſſen* the *Motion* of its *Liquor*. Or, 'tis not hard to Apprehend how *Wounding* by *Cantharides* hinders the Diſpoſition of *Separating Spirits*, and *Intercepts* them in their way to the *Heart*; How they make its *weaker Contraction*, and a *ſlower Pulſe*. Or again, it is evident, How the ſmall *Emiſſaries* made in this way can *Cure* a *Fever*, and a *Delirium*, in a *ſhorter* time than is ſuppoſed in the *Propoſition*.

From this Diſcourſe we may deduce theſe *Corollaries*. 1. That the *Operation* of a *Bliſter* is great and ſuddain; That the *Wounding* of this *Nerve*, or a *Branch*, is ſo abſolutely neceſſary for *Curing* a *Delirium* and a *Fever*, that whatſoever *Miſchief* the applying of vaſt Numbers of *Bliſters* over all the Body may do, yet the *Main End* is neglected, if you forget a large one *high* on the *Nop* of the *Neck*. 2. That if there is no *Veſication* after the laying on a ſtrong *Plaiſter*, it neceſſarily eſtabliſhes a new and prodigious *Hardneſs* in the *Skin* and *Veſſels*, and a *Thickning* of the *Blood* for a further *Total Stop*.

XXXI. About the beginning of *November*, 1693. after a conſtant Courſe of moderately *Warm* Weather for the Seaſon, upon ſome *Snow* falling in the Mountains and Country about the Town, of a ſudden it grew extreamly *Cold*, and ſoon after ſucceeded ſome few Days of very *hard Froſt*; whereupon *Rheums* of all kinds, ſuch as violent *Coughs* that chiefly affected in the Night

Obſervations on Epidemical *Diſtempers*; *by Dr.* Tho. Molineux. n. 209. *p.* 105.

Night, great *Defluxion* of thin *Rheum* at the Noſe and Eyes, immoderate diſcharge of the *Saliva* by Spitting, *Hoarſneſs* in the Voice, Sore Throats with ſome trouble in Swallowing, Wheaſings, Stuffings, and Soreneſs in the *Breaſt*, a dull Heavineſs and Stoppage in the Head, with ſuch like Diſorders, the uſual Effects of *Cold*, ſeized great Numbers of all ſorts of People in *Dublin*.

Some were more violently affected, ſo as to be confin'd a while to their Beds, thoſe complain'd of *Feveriſh* Symptoms, as Shiverings and Chilneſs all over them that made ſeveral returns, Pains in many Parts of their Body; ſevere Head-aches, chiefly about their Fore-heads, ſo as that any Noiſe was very troubleſome; great Weakneſs in their Eyes, that the leaſt Light was offenſive; a perfect decay of all Appetite; foul turbid Urine, with a Brick-colour'd ſediment at the bottom; great Uneaſineſs and Toſſing in their Beds all Night: Yet theſe Diſorders, though they much frightned both the Sick and their Friends, uſually without help of Remedy, would abate of themſelves, and terminate in Univerſal *Sweats*, that conſtantly relieved. This more violent Degree of the *Cold* was more apt, I found, to fall on ſuch as were given to Exceſs either in Eating or Drinking, or inclinable to a *Scrophulous* Diſpoſition of Body, than on thoſe that were more Temperate, and leſs ſubject to Obſtructions.

When the *Cold* was but moderate, it uſually was over in 8 or 10 *Days*: but with thoſe in whom it roſe to a greater Height, it continu'd a *Fortnight*, 3 *Weeks*, and ſometimes above a *Month*; one way or other it univerſally Affected all kinds of Men; thoſe in the Country, as well as City; thoſe that were much abroad in the open Air, and thoſe that ſtay'd much within Doors, or even kept cloſe in their Chambers; thoſe that were Robuſt and Hardy, as well as thoſe who were Weakly and Tender; Men, Women, and Children of all Ranks and Conditions, the Youngeſt and the Oldeſt; though I think if it were favourable to any ſort, it moſt ſpared thoſe that were Aged, among whom I knew ſeveral, that were not the leaſt troubled with it, yet it ſeiz'd ſo univerſally, that not one in 30, perhaps I might ſafely ſay more, eſcaped it.

As it firſt appear'd towards the Beginning of *November*, ſo it ſeem'd to arrive to its *Greateſt Degree* of *Violence*, and ſpread moſt *Univerſally*, about the Middle of it; and by the Beginning of the *Month* following, it very ſenſibly *Abated*; ſo that very few then complain'd of their *Colds*. So that in the ſpace of 4 or 5 Weeks it had its *Riſe*, *Growth*, and *Decay*; and though from firſt to laſt it ſeized ſuch incredible Numbers of all ſorts of Men, I cannot learn that any one truly *Dyed* of it, unleſs ſuch whoſe Strength was before ſpent by ſome tedious Fit of Sickneſs, or laboured under ſome heavier Diſeaſe complicated with it.

I find that about *November* and *December*, 1691. by ſome ſhort Notes I took then, *Coughs* were more than ordinary frequent here in *Dublin*, though nothing comparable to what they were lately; they chiefly then Affected Young Children, whoſe *Coughs* uſually turn'd to a violent *Chin-Cough*: Yet at this time, among all the variety of *Coughing* Children, I have not met with

with more than one, that was troubled with a *Chin-Cough*, and that too was but in a ſlight manner; Which Minute Differences in the ways of *Epidemick* Diſtempers operating in our Bodies, clearly ſhew, that their *Cauſes* cannot be aſcribed only to the ſenſible *Alterations* of the *Weather*, or the manifeſt qualities of *Heat*, *Cold*, *Moiſture* or *Dryneſs*, highly predominant in the Air, according to the vulgar Solution of them: but that they proceed from ſomething more Nice and Latent than all this.

But to return to our *General Cold*; It was further remarkable for it's *Vaſt Extent*. It ſeiz'd them at *London*, *Oxford*, and all other places of *England*, as *univerſally*, and with the ſame *Symptoms*, as it ſeized us in *Dublin*; but with this obſervable Difference, that it appeared 3 or 4 *Weeks* ſooner in *London*, than in *Dublin*. It alſo reacht the *Continent* and infeſted the Northern Parts of *France*, as about *Paris*, *Flanders*, *Holland*, and the reſt of the *United Provinces*, with more *Violence*, and no leſs frequency, than it did in theſe Countries: ſo that I believe no *Epidemick* Diſtemper was ever obſerved to *extend* ſo far.

No Example of any *Epidemick* Diſtemper ſeems in all reſpects to come nearer in Competition with our late general *Cold*, than the *Tranſient Fever* in 1688. This ſhort ſort of *Fever* was firſt obſerved in *Dublin* about the beginning of *July*, and it ſo *univerſally* ſeiz'd all ſorts of Men whatever, that I then made an Eſtimate not above one in 15 eſcaped. It began, as generally *Feavers* do, with a Chilneſs and Shivering all over, like that of an Ague, but not ſo violent, which ſoon broke out into a dry *Burning Heat*, with great *uneaſineſs* that commonly confin'd them to their Beds, where they paſſed the enſuing Night very *reſtleſs*; they complained likewiſe of *Giddineſs*, and a *dull Pain* in their *Heads*, chiefly about their Eyes, with unſettled *Pains* in their *Limbs*, and about the ſmall of their Back, a ſoreneſs all over their Fleſh, a loſs of *Appetite*, with a *Nauſea* or Aptneſs to Vomit, an unuſual *Ill Taſte* in their Mouths, yet little or no *Thirſt*: And tho' theſe *Symptoms* were very violent for a time, yet they did not continue long: for about the 2d. *Day* of the Diſtemper, the Patient uſually of himſelf fell into a *Sweat*, (unleſs 'twas prevented by letting *Blood*, which however beneficial in other *Fevers*, I found, manifeſtly retarded the Progreſs of this) and if the *Sweat* was encouraged for 5 or 6 *Hours* by laying on more Cloaths, or taking ſome *Sudorifick* Medicine, moſt of the Diſorders before mentioned would entirely diſappear, or at leaſt very much abate. The *Giddineſs* of their Head, and want of *Appetite* would often continue ſome days afterwards, but with the uſe of open Freſh Air they certainly in 4 or 5 *Days* at fartheſt recovered theſe likewiſe, and were perfectly well. This Tranſient Diſeaſe was ſo favourable, that not one in a Thouſand Dyed of it: And by the middle of *Auguſt* it wholly diſappeared; ſo that it had run its full Courſe through all ſorts of People in 7 *Weeks* time. It alſo *ſpread* it ſelf all over *England*, and raged as *generally* in *London* as in *Dublin*, and with the ſame Concourſe of *Symptoms*. But it *begun* to be taken notice of at *London* about the middle of *May*, and it *continued* there till the latter end of *June*; ſo that it did not ſhew itſelf *here* till it had wholly diſappeared *there*. And it was very re-

markable that in *England*, as well as *here*, a ſhort time before this *General Fever*, a ſlight Diſeaſe, but very *univerſal*, ſeiz'd the *Horſes* too, and ſhewed it ſelf by a great *Defluxion* of *Rheum* from their Noſes; which ſhews the *Cauſe* of *ſpreading Diſtempers* to be ſo prevalent, that it works not only on the finer and more delicate Compoſition of *Humane Bodies*, but Affects even the more ſtrong and groſs frame of one of the moſt *Robuſt* Animal Productions in Nature.

From theſe *Hiſtories* one may probably gather, that ſpreading *Epidemick Diſtempers* take their Progreſs from *Eaſt* to *Weſt*. But this ſhould be further confirm'd by more frequent Obſervations, before one may ſafely determine any thing in this matter. However this is certain, that the *Plague* and *Peſtilential Fevers* Rage more frequently in the *Eaſt*, towards *Conſtantinople* and the *Levant*, than in theſe more *Weſtern* Parts of *Europe*; as if that ſeem'd a more Natural *Clime* for their *Riſe* and *Propagation*.

Exotick *Diſeaſes Propagated by Trade and* Infection; *by Dr.* Liſter. *n.* 165. P. 793. *Plague. Small-Pox.*

XXXII. 1. The *Plague* is properly a *Diſeaſe* of *Aſia*, where it is Epidemical; and is never *Bred* amongſt us, but comes to us by *Trade* and *Infection*.

2. The *Small Pox* alſo is an *Exotick Diſeaſe* of the *Oriental People*, and not known to *Europe*, or even *Aſia Minor*, or *Africa* at all, till a *Spice Trade* was open'd by the later Princes of *Egypt* to the remoteſt Parts of the *Eaſt-Indies*, whence it *Originally* came, and where it Rages more cruelly at this Day than with us.

Griping of the Guts.

The like I think of the *Griping of the Guts*, that it is a peculiar *Diſeaſe* of the *Weſt-Indies*, and Yearly received from thence, for this reaſon that it is none of the *Tormina Ventris* of the Antients; and therefore call'd by a New Name, by ſuch as have writ of it; and alſo for that it is yet ſcarce known in any Part of the *North* of *England*, or *Midland Countries* thereof.

An Experiment concerning the Plague; *by Dr.* Jo. Bapt. Alpruinus. *Ph. Col.* N. 20. p. 17.

XXXIII. No *Poiſon* is greater than that of the *Siekneſs*; our outward Senſes are not Affected by it, and our Underſtanding does not comprehend it; 'tis *Aërial* and *Volatile*, and 'tis *Fixt* and *Coagulated* when it concretes into *Bubo's*. Hence I conceived that the way for me to Penetrate into the moſt Latent quality of this *Peſtiferous Venom* was by *Chymiſtry*; not with Knives but *Glaſſes*; not with Iron but *Fire*. This horrid undertaking (for the Glory of God, for the favour of my Prince, and the good of my Neighbour) I ſet upon without dread. Having lanced a *Peſtilential Boyl* of M. *Godfrey Reſhel*, I Collected the *Virulent* Matter, and putting it in a *Retort*, and Luting a *Receiver* to it very cloſe, I applied Degrees of *Fire*; at firſt came over a *Water*, then a more Fat and *Oyly* Matter; and at laſt a *Salt* Aſcended into the Neck of the *Retort*. The *Fire* being removed and the Glaſſes ſeparated, there came forth ſo great a *Stench*, that a Thouſand Wounds expoſed to the Summer Heat could not have parallell'd it. And though I thought I had ſufficiently Arm'd my Senſes againſt it, that is my Ears with Cotton, my Noſe with Peſſaries, my Mouth with Sponges, all dipt in Vinegars and Treacles, yet as if touched with a Thunderbolt, I was ſtruck with a *Violent Trembling* of my

my Body. To make ſhort, having broken the *Glaſs*, I gave ſome of this *horribly ſtinking Salt* to M. *Reſhel* to *Taſte*, and then I taſted it my ſelf, and 'twas found to have an *Acrimony* as great as *Aqua Regis*.

Hence no wonder that ſo many are ſo afflicted with continual *Vomiting*, ſo that they can keep neither Meat nor Drink, ſince their Stomach is continually irritated to this Expulſion by a *Poiſonous* quality ſo *Sharp*.

Hence no wonder, if from the *Sharpneſs* of this *Venom* agitating the Humours, and urging the expulſive Faculty to a continual perturbation of the Belly, a *Diarrhæa* is often cauſed, which follows the *Patient* to Death.

Hence no wonder, that from this *Sharp* Matter, ſuch piercing *Pains* are felt in *Bubo*'s, and ſuch *Burnings* in *Carbuncles*.

Hence no wonder, why the beſt Remedies (and as it were the Anchors of Safety) are *Sudorificks*, allaying the *Acrimony*, and driving it out through the Pores; for I found thoſe always which *Sweat*, were in a hopeful way of Recovery; but thoſe which did not, were almoſt all taken off. I therefore ordered *Sudorificks* to be repeated every 8 *Hours*, and ſtrengthning *Cordials* every *Hour*.

My uſual *Sudorificks* for the better ſort were, *Species Diamoſci, Diambræ, Liberantes Pannonicæ Rubræ, Extractum contrayervæ, Lapis Bezoar, Unicornu Marinum*, (my *Specifick Powder*) *Sal. C. C. volat. Succinum volat. conchæ Perlar. Volatil. Aqu. cord. temp. cum Moſcho. Scorzon. Cardui Bened. Syr. Scordii, Corallor.*

For the Meaner ſort, *Species Cord. temperat. Electuar. de Ovo, Antimon. Diaphoret. Bezoarticum minerale Joviale cum Aquis ſupradict. & Syrup.*

My *Cordials* for the Richer ſort were, *Confect. Alcherm. de Hyacinth. magiſt. Perla. Hyacinth. Granator. cum Aquis é toto Citro, Saxon. Salæ*, &c.

For the Meaner ſort, *Corallia rubra contuſa, Confect. Alcherm. in complet. cum Aquis tormentil. Cardui bened.* &c.

Theſe were in general the Medicines uſed in this Diſtemper, but with Variety, according as the Age, Temperature, and Condition of the Patient required.

A Preſervative againſt this Contagion.

But becauſe no *Alexipharmick* is ſufficient in this *Contagion*, therefore grounding my Judgment upon the Principles of *Harvey* about the *Motion* of the *Heart*, and the *Circulation* of the *Blood*, and ſome other of *Bartholine* and others, I concluded this *Peſtiferous Venom*, attracted by the Breath or Pores, by the *Circulation* of the *Blood*, to be carried to the *Axillary* and *Inguinal Glandules*, &c. where if it long ſtagnates it Concretes into *Bubo's*, which tend to *Maturation*; but if it opens it ſelf a way, and paſſes with the natural *Motion* of the *Blood*, and ſo is carried to the *Heart*, then *Death* enſues. Therefore not only for my ſelf, but for two other Friends, I made *Inciſion* with a Lancet *in Inguine dextro & Siniſtro*, and put in a *Cetum*, to the end, that by this artificial way the *Venom* might find a Paſſage. This I often tried with good Succeſs, great quantity of Matter always voiding that way, but more notably when I was any way toucht with *Peſtilential* ſtrokes, or alterations. By the help of which, I kept my ſelf in good Health, during the *Contagion* which Raged here at *Prague* in 1680.

An Universal Preservative *against* Infection; *by Dr.* Jaco. Joh. Wenceslaus Dobrzensky *de Nigro Ponte.* Ph. Col. n. 2. p. 20.

XXXIV. Whosoever converses with Patients Affected with any *Disease* whatever, if he would preserve himself from *Infection*, must be sure, so long as he abides within the Sphere of their Steams, never to Swallow his *Spittle*, but to spit it out. For this Author conceives that to be the Part which first and most easily Imbibes the *Infection*, and by that swallowed the *Infection* is carried, as by a proper Vehicle, into the *Stomach*, where it works those dismal and Fatal Effects.

This Sentence of his he grounds, both upon his own Experience long tried for his own *Preservation*, and on divers Reasons set down by way of Aphorisms from this *Hypothesis*; viz.

That most *Diseases*, especially *Pestilential Feavers*, are *Infectious*; that this proceeds from a *Seminal Ferment*, which is emitted by the Patient by way of *Steams* into the encompassing Air, and so *Infects* all things within a certain Sphere or Distance; This drawn into the *Mouth* by the *Breath* is apt to *Infect* the *Saliva* or Spittle, which being *swallowed Infects* the *Stomach*; and so the rest of the Body; but being *Spit* out frees the Body from *Infection*. And therefore he conceives that Strong *Smelling* and Strong *Tasting* Substances, kept in the Mouth and chewed to promote *Spitting*, are of very good and necessary use for *Physitians*, *Chirurgeons*, and *Apothecaries*, &c. that are necessitated to visit *Infected* Persons.

An Hydrophoby; *by Dr.* Mart. Lister. *n.* 147. *p.* 162.

XXXV. *James Corton* (of *York*) a very strong and well built Youngman, was *Bit* with a *Mad Dog* in the Right-Hand, the Wound heal'd of it self, and the thing was forgot. After about 5 or 6 Weeks, he complains of *Pain* all over his *Bones*, but especially his *Back* and round about his *Stomach*, looks very *Pale*, *Hollow-Ey'd*, &c. The 3d Day after this Complaint, *viz. Sunday Mar.* 11. $168\frac{2}{3}$. he called for Burnt Brandy, drank it, went to Bed and Vomited it up; after this he had a *Restless Night*, and in the Morning found himself very Ill, with a strong *Rising* in his *Stomach*, and tho' no *Thirst*, yet an impotence to *Drink*, and even to Swallow his *Spittle*, which was Death to him as he often said. *Diascordium* and a Bottle of *Cordial Water* was brought to him by an Apothecary that Morning; the *Diascordium* he took, but was not able to *Drink* of the *Cordial* one Spoonfull. This on *Monday* Morning; about one a Clock that Day I first saw him, and found him upon his Bed, his *Pulse* very *slow*, and sometimes *unequall*, but not unless frighted from the *Rising* of his *Stomach*; his *Flesh Cold*, his *Tongue* not Dry but Flexible and *Moist*, a little *white*. I caused him to rise off the Bed, and set him full in the Light; and then because he mightily complain'd of I know not what Sickness about his *Stomach*, I offered him of the *Cordial*, but he *Started* and *Trembled* at the approach of it. This I exceedingly admir'd, wherefore I call'd for a Glass of *Wine* or *Water*, and a Tumbler of *Water* was brought me up, which I gave him to *Drink*; but he vehemently *started* at it, and his *Stomach* swell'd and *Rise*, after I know not what odd and strange manner; and I could then find his *Pulse* very *Trembling* and disturb'd. I still urg'd him to Drink, but as I put it forwards to his Mouth, he the more *Affrighted* drew back his Head, and *Sigh-*

ed,

ed, and Eyed it with a moſt Gaſtly Look, not without *Screeking* and Noiſe; This ſoon convinc'd me that it was *Aquæ Pavor*. I forthwith order'd a *Vein* to be opened in the Arm which was *Bit*, caus'd the *Wound* to be *Scarify'd* and drawn with *Veſicatories*, and the ſame Plaiſter to be apply'd to the Neck and Legs and the inſide of the Arms; I ordered the uſual and famed *Antidotes* to be given him as of *Theriaca*, *Cinis Cancrorum*, *Ruta*, *Agaricus*, &c. in *Bolus's*. For it is to be noted, that Solid things in a Spoon he could take, but yet not without much *Trembling* and *Fear*, and *Caution*, and an earneſt Requeſt that no Body would ſuddenly offer them to him, but give them into his Hand gently; and then he would by degrees ſteal his Hand Softly towards his Mouth, and of a ſudden Chop the Spoon in and Swallow what was in it, *velut Canis ad Offam*; and this he did more *greedily* and readily than any other Man could do. Of theſe *Antidotes* in *Bolus* he took a *Dram* every *hour*, and always in this Manner, for at leaſt a dozen times taking; and every like, *Drink* was proffered him in the Night, but he could not ſee it without *Horrour*, and the ſame Motions from his *Stomach*. Nay, he did affirm that as oft as he by Chance ſwallowed any *Spittle* it went to his Heart, even as though he ſhou'd Dye that very Moment. This Night paſſed wholly without any *Sleep* or Reſt.

Tueſday Morning I view'd his Blood, which was, both as to the *Serum* and *Cake*, well colour'd and in ſuch Proportion as is uſual in Healthfull Perſons, and of good *Conſiſtence*. He had now a *Violent Fever* upon him, and a very *Quick Pulſe*. *Water* was offered him by my Order, but in vain, He begging he might Dye unmoleſted; nothing being ſuch a *Terror* to him as the approach of any *Drink*. I then, with much difficulty, perſwaded him to caſt himſelf croſs the Bed upon his Belly (for he had his Cloaths looſely about him) hanging his *Head* over the other ſide; perſwading my ſelf that this poſture might be advantageous to his *Drinking*, ſince that in the erect poſture of a Man he could not ſo much as endure the approach of Liquor. In this Poſture then of a *Dog*, he ſuffered a large Bowl fill'd with *Small-Beer* to be brought under his Head, and imbracing it with Raptures of Joy, he declared he was infinitely refreſht with the ſmell of it; that he now ſaw it with delight, and aſſur'd us he ſhould be able ſoon to *Drink* it all off. And he that now thought himſelf a Dying Man talked pleaſantly, and ſaid many paſſionate things to his Brother, Wife, *&c.* Wonderfully extolling this Invention, and thanking me for it. He endeavour'd with great earneſtneſs to put down his Head to it, but could not; His *Stomach Riſe* as often as he opened his Lips; At length he put out his Tongue, and made towards it as though he would *lap*; but ever as his *Tongue* never ſo little touched the ſurface of the *Beer*, he ſtarted back *Affrighted*. And yet all this while was pleaſed with the thoughts of *Drinking*; and would not ſuffer the Maid Servant to take it away from under his Head; and if ſhe did a little withdraw it, he ſaid he followed it by the ſmell with Delight, Snuffing with his Noſtrills. After a long time being mightily foil'd, he alledged that the faint Smell of the *Small-Beer* hindred him from *Drinking*, and therefore deſired a Bowl of *Ale*; which was brought him: but

after

after much ſtriving, and exerting his *Tongue* a thouſand times, he could not *Drink* of it; and *Lapping* with great *affrights*, as oft as his *Tongue* touched it he ſtarted back with his Head, bringing it down again gently to the Bowl a hundred times, but all in vain. And in this poſture, what upon his Belly and what upon his Hands and Knees, he kept himſelf at leaſt an *Hour* thus Tantalizing himſelf; but it was not in his power to *Drink*. We then gave him a Quill which conſiſted of 2 or 3 Joynts, the one end in his Mouth the other in the Liquor; but he could not manage it, nor *Suck*, no more than a *Dog*. I perſwaded him to give over and lye down, which he did; and not long after my going away he fell into a *Convulſion Fit*, *Bit* and *Snarl'd* and *Catch'd* at every body, and *Foam'd* at the Mouth. After this *Fit* was over, he took an *Elleboriſm* in a *Bolus*, which was taken like the reſt, and very willingly by him; it wrought about 3 or 4 times very plentifully, and he declared himſelf wonderfully at eaſe by it; but yet now and then fell *Convulſed*, and then always Inſenſible. And after 4 *Hours* I return'd to him again, and found the Miniſter with him; he talked very ſenſibly to him, prayed very earneſtly with him, ſaying the Prayers after him, and deſired the *Sacrament*, which in theſe Circumſtances could not be given.

He was again ſolicited to *Drink*, and he now readily enough put himſelf into the former poſture, and with as much earneſtneſs as ever uſed all the little ſhifts to *Drink*, while the Bowl was under his Head; but all in vain. He had a little Silver Tumbler filled with *Drink* put into his Hand; which ſuddenly, when he had as it were ſtolen it near his Mouth, he would have thrown it into his Throat, as he did the *Bolus*'s; but it hit againſt his Teeth and fell into the Bowl. I cannot ſay he ever went to *Stool* or made *Water* all this time, and therefore had a *Clyſter* given him; but upon parting with it, which he did immediately almoſt as ſoon as given, he *Died Convulſed*: But his not *Making Water*, as well as a troubleſome *Priapiſme* which he complain'd of when upon his Knees, might proceed from the *Bliſtering Plaiſters*, as well as from his *Diſeaſe*.

That nothing may be omitted which relates to this Caſe; the day after his *Interment* I accidentally met with his Cozen Mrs. *S.* who told me that her Daughter was in fear, for juſt that very day *Fortnight* before his Death ſhe had been at his Houſe, and he would go home with her to her Mother's; that ſhe remembred his Hand *Trembled* and his Body *Shaked*, that he was in a *Cold Sweat*, and in a great diſorder, ſo that ſhe asked him what he ail'd: he told her, that after his Work (for he was an Upholſterer) it had been of late uſual with him. And which was Remarkable the very *Dog* which *Bit* him came at that time along with him, to her Mother's Houſe; and was alive and well at the Man's Death.

To this we may add, that Mr. *Widdow*, a Mercer, doth affirm, that about the very time that Mr. *Corton* was thought to be *Bit* with Mr. *Sutton*'s *Dog*, a black Dog, which he verily believes to be the ſame, came and *Bit* a *Whelp* of his in his Shop. The next day the *Whelp* ran *Mad* up and down the Houſe, and *Bit* both him and the Maid in the Leg, and dyed that very day. About a Month after he was *Bit* he found himſelf not well, and

was

was troubled with a *Pain* at his *Heart*, and had a *Fearfulneſs* and *Trembling* upon him, and got no reſt for 3 *Nights*, upon which he had himſelf *Blooded*, and found himſelf better; his *Maid* doth not yet complain of any *Harm*.

It is very hard to give any probable Reaſon of this *Aquæ Pavor*: what *Galen* (*de Theriaca*) ſays of their much Coveting *Water*, becauſe of the intolerable *Thirſt* upon them, agrees not with our Caſe. For this Man would often ſay that he was not *Thirſty*, which alſo appeared by the *Moiſture* and *Flexibility* of his *Tongue*. Nor was he *Diſtracted* as *Galen* would have them, but all the time in his Wits and diſcourſed Rationally. What *Julius Palmarius* means by the 3d *Paroxyſm* of an *Hydrophobia*, I cannot underſtand. For this Man had the Diſeaſe upon him continually from the firſt Moment to his *Death*, which was near 48 *Hours* without any *Intermiſſion*. *Dioſcorides* Treats of it moſt Soberly, and is to be Credited; *Quidam, qui jam* Aquæ metum *ſentirent, ſumpto* Helleboro, *ſimulac primum Morbi impetum experirentur, ſanati ſunt*: *Nam & jam* vitio tentatos *nemo unquam ſervare poteſt*. This very well agrees with our Caſe; The *latter Perſon*, who had a ſenſe of the *Evil*, had it prevented by *Bleeding*, but our *Man*, which had the *Evil*, that is, the *Aquæ Pavor* upon him, not *Bleeding*, or the moſt Famed *Antidotes*, or even *Hellebore*, could in the leaſt ſave, tho' not very untimely given him. *De* Morbis Contagioſis.

The Caſe indeed ſo rarely occurrs, that it cannot be obſerved in all due Circumſtances, in order to its clearer Underſtanding, and conſequently *Cure*; we ſhall venture however, to lay down ſome few things to *Solve* it by.

Firſt, That *J. Corton* had ſome of the *Organick Parts* of his Body Tranſformed into, or Affected after the nature of a *Dog*, eſpecially the *Gula*, *Tongue*, &c; ſo that what was offered to him in the *Erect* Poſture of a *Man* was very *frightfull*, as well as difficult for him to take, becauſe againſt his New Nature, as much as it would be for us to get a *Dog* to *Drink* ſtanding upon his hinder Legs. But yet this is not all, for when he was turned upon his Belly, and would have Acted the *Dog*, he yet could not *Drink*; and tho' he frequently put out his *Tongue* and *Lapt*, yet he could not endure to take any thing into his Mouth of Liquor, as though ſomething had hindred him within. Therefore we may imagine he was alſo *Convulſed* in thoſe Parts, or Swell'd: but this we cannot Grant, for the contrary does plainly appear, becauſe he could caſt any thing into his Mouth and Swallow it; as he did very many times ſtif *Bolus*'s, more nimbly as to the Swallow, than any Man reaſonably could be ſuppoſed to do, that was ſo weakened.

Secondly, That his *Spittle* was *Envenomed*; for as oft as he Swallowed it, (his *Stomach* vehemently abhorring it) it went to his Heart (as we ſay), and was even preſent Death to him. And ſo liquid things coming nearer to the conſiſtence of *Spittle* might the rather *movere Salivam*, and therefore gave him a greater *Terrour* and Difficulty to Swallow, than *Solid* things. And that his *Spittle* chiefly was *Infected* with the *Venom* of the *Dog*, ſeems probable

Gal. *de Locis Affec.* lib. 6.

probable from theſe reaſons alſo. 1. Becauſe the *Dog* Bit him, whoſe *Spittle* alone to be *Venemous* to the Touch, there are many credible Inſtances in *Medical Hiſtory*. 2. He was almoſt like a *Dog* in the Mouth, *viz.* where are the proper Organs of the *Saliva*. 3. The *Bite* of a *Man ſo Bitten* is a-like *Infectious*; but otherwiſe *Innocent*.

But it may be askt how comes it to *Infect* his *Spittle*, and not other *Humours* and the *Blood*. I anſwer, the *Blood* in part was undoubtedly Affected, as the *Symptoms* ariſing before the *Aquæ pavor* (which yet is the only true *Pathognomick* of the *Diſeaſe*) demonſtrate. Again the *Blood* is not One *Liquor* (as is generally thought) but many Diſtinct *Liquors* circulated together in one Set of common Veſſels; and ſo it might *Infect* that Liquor, which it was moſt a-kin to, as the *Saliva* of a *Dog* to the *Saliva* of a *Man*.

'*An* Hydrophoby; *by Dr.* Koger Howman. n. 169. p. 916.

XXXVI. On *Wedneſday* at Evening, *Oct.* 1. 1684. I was call'd to a Patient at *Norwich*, who about 6 *Weeks* before had been *Bitten* with a *Mad Fox* on the Right Hand; he began to be indiſpoſed the *Saturday* before with *running Pains*, yet ſo well as to be abroad next day at Church: on *Monday* his *Pains* grew more troubleſome, and the *day following*, much worſe, eſpecially, on his Right Hand, Arm, Shoulder and Back, but not to confinement: On *Wedneſday* (I know not by whoſe advice,) he took a Doſe of the common *Purging Spirit* of *Scurvy-graſs*, which gave him 7 or 8 Stools, and made him very faint, and weak; ſo I found him; and complaining that he could not uſe his Right Hand (it Beginning to be *Paralyticall,*) tho' his *Pains* were much abated there, and where elſe they had been moſt troubleſome, excepting only on the lower Parts, or ſmall of his Back, where they ſoon after vaniſhed alſo. He told me he Bled freely at the *Wounds* the *Fox* had made, and that they *Healed* without any farther trouble, than now and then a little *Girding Pain* on that Hand and Arm; and further ſaid, (to pleaſe his Friends,) he had taken a white Powder of an Apothecary, and believed himſelf in no Danger of what was feared (for I had diſcovered the Danger I apprehended in his Condition). Tho' the *Aquæ Pavor* did not yet appear, his *Heat* was much encreaſed and his Pulſe *intermitted* every 5*th* or 6*th* Stroak, but on the *Right ſide only*; which I again and again examin'd, finding no Variation; he alſo looked Gaſtly and Thin, but his Eyes ſparkling and Fiery. I preſcrib'd the beſt Temperate *Antiſpaſmodic* and *Antiparalytic* Remedies I knew, to be mixt with the *Specificks* of common uſe in an *Hydrophobia*; thus much on *Wedneſday* at Night. Next *Morning* he complained his Night had been *Reſtleſs*, that then he had wholly loſt the *Uſe* of his Right Hand, and tho' the *Pains* were more abated, yet he was very Hot and uneaſie: his *Pulſe* then was much ſtronger than over Night, but *intermitted* on the *Right ſide only* as before, his Countenance was ſomewhat more Gaſtly, yet his Veins very full as *in Initio & Augmento Febris*, and no *Hydrophobia* appearing, I adviſed him to Bleed 6 or 7 Ounces at the Left Arm, (the Right being *Paralytical,*) and the continuance of what I had preſcrib'd before; he Bled 8 Ounces very freely, the *Blood* well coloured but very thick. After I left him, the great *Symptome* appeared, and in my Abſence, another was conſulted who gave him

him many Remedies. At my return out of the Country on *Friday* at 6 at Night, his *Heat* was very great, and his *Pulſe* very high, and *intermitted* then on *both Wriſts*, and if any thing were offered him to *Drink*, *Standing* or *Sitting*, he *Started* as if his Head would have fallen backwards off his Shoulders, but when *Laid* upon his Pillow, could (tho' with great *difficulty* and uneaſineſs,) now and then get down a Spoonful. He looked then very Thin and Gaſtly, and ſeem'd Shy or Afraid of every Body that came ſuddenly near him, telling them that they Stifled him, or ſtopt or hindred his Breath in coming ſo haſtily to him. His *Reaſon* was all along very good, and (as ſome obſerv'd) better than in his Health: his *Voice* was broken and imperfect, as theirs whoſe Tongue and other Organs of Speech are growing *Paralytical*. I ſaw him again at 10 that Night when all *Symptoms* were growing worſe; yet he could then Walk out of one Chamber into another, with very little help, but between 12 and 1 next Morning he *Died*, without any *Convulſive* Motions, Sighs or Groans; as if in a Moment there had been a total *Paralyſis*.

From this Relation it's moſt Obſervable. 1. That as the *Pains*, (which were like thoſe in the *Rheumatiſm*,) abated, the *Paralyſis* and *Feaver* increaſed. 2. As the *Feaver* increaſed, the *Intermiſſion* of the *Pulſe* grew more frequent, tho' the *Pulſe* were much *Stronger*; but why it *Intermitted* firſt on but *one ſide*, is not eaſily accounted for. 3. That the Imperfection of *Voice*, as well as the Difficulty of *Swallowing* were the Effects of the *Paralyſis*, may probably be allowed, and be a ſatisfactory Reaſon, why the Perſon Dr. *Liſter* mentions, could not uſe the *Quill* which was given him to *Suck* with. 4. That his thin Gaſtly Aſpect, the Defect of Spirits and Tonic Vigour, (if I may ſo call it,) was from a *Paralytical* Original, is not unreaſonable to conjecture, 5. That the *Paralyſis* chiefly affected the *Muſcles* of the *Head* and Upper Parts, may be partly collected from his inability to hold his Head *Steady* at the approach of any *Liquor*; the *Fear* thence ariſing, cauſing him to *Start*, and his *Head* ſo to fall backwards, as if it would fall off his Shoulders. 6. And that his Lower Parts were leſs affected, is probable, becauſe, 2 or 3 *Hours* before he *Died*, he could *Walk* out of one Chamber into another, even when his *Voice* was hardly intelligible.

A Child Bit by a Mad Dog; *by Mr.* I Turner. n. 207, p. 24.

XXXVII. In the Year 1688, there was brought to us for Cure a Child of about 3 Years of Age, who had juſt then received a large *Wound* upon the *Maſſeter Muſcle* by the *Bite* of a *Mad Dog*. The Wound we treated with *Digeſtives* for ſome time, *Sutures* were forborn, though otherwiſe neceſſary, that the *Sanation* thereof being defer'd, the Contracted *Venom* might have the freer Egreſs thereat. There was in ſhort time diſcharged a very laudable *Pus*, and the Wound *Incarned* as faſt as we could deſire. In about 3 Weeks time we had *Incarned*, and brought over a very firm and ſeemly *Cicatrix*; and in about 2 Days after *Cicatrizing* the *Wound*, the Child was ſeiz'd with a *Fever*, a diſorderly *Pulſe*, and *Palpitation* of the *Heart*: The Night enſuing he grew *Delirious*, and the Succeeding day the *Malignity* had made ſo virulent an Impreſſion upon the Animal Spirits, as

did excite very ſtrong Irritations in the Members of the Body by *Convelling* of their Muſcular Fibres. Neither was the *Brain* and its parts freed from the ſame Morbid Taint, which manifeſted its Ferocity in a moſt ſtrange and unuſual *Diſtortion* of the *Eyes*, from a confuſed and irregular Expanſion of the *Optick Nerve*, attended with an extraordinary *fierceneſs* in the whole Viſage, continual *Vigilies* and a conſtant *Trepidation*, with a reiterated *ſnatching* up of the lower *Mandible*, making Signs as if he would have *Bit* at any thing that was offered him. His *Voice* was uttered with a *Canine Hoarſeneſs*, and had an extraordinary reſemblance to the *Barking* of a *Dog*. He was moreover infeſted from that time with a *Singultus*, and *Foaming* at the *Mouth*. He was no ſooner ſenſible of the *Reflection* of a *Looking-glaſs*, which out of Curioſity I preſented before him, than he *Threw* his *Head backwards* with great Violence, and continued *Barking*, and *Snapping* at every thing near him: In the Evening, notwithſtanding ſuch *Alexipharmicks* as had been exhibited, he ſunk under the Oppreſſion of theſe cruel *Symptoms*. I was not permitted to open him: But the *Abdomen*, I perceived, was exceſſively *Inflated*, his Limbs *Convulſed*, and the Superfice of the Body of a *Livid* Colour; the Muſcles of the Face were drawn into ſuch a form as did nearly repreſent a *Spaſmus Cynicus*.

Two Boys, in Ireland, Bit by a Mad Dog; by Mr. Keneda, n. 242. p. 246. n. 243. p. 308.

XXXVIII. About the laſt of *Oct.* 1679. it happened that 2 Boys of 10 and 9 Years Old, of a Sanguine and Cholerick Complexion, did *Touch* and *Handle* the Head of a *Dog* which had been *wounded* by a *Mad Dog*, but by the *Handling* and *Waſhing* of his *Wound* by the Children, the *Dog* ſo *wounded* was heal'd, and did not become *Mad*. But about *May* 1680. the Children became *unwell*, and were ſeized with a *Paining Grief* towards the *bottom* of their *Bellies*, which did Grind and Torment them with *Pain* and Trouble, which Aſcended gradually upwards towards their *Navil*. And about the 1*ſt*. of *July*, together with the foreſaid *Grief*, they were taken with a ſlow *Flux*, and with *Fainting Fits* by times, when the foreſaid Pains aſſaulted them. After they had continued thus for a time, their *Pain* and *Grief* Aſcended towards and above the *Stomach*, whereupon followed very violent and *Convulſive like Motions* in their Bodies, eſpecially about the *Stomach* and *Belly*, by which they were toſſed and tumbled and diſturbed in the whole Body, with ſome *Foaming* at the *Mouth*, in the interim of their *Fits*; now and then theſe *Symptoms* continued and increaſed until the latter end of *Auguſt*, that they were taken with the *Fear of Water*, and could not endure to *look* into any *Liquid* thing, until the Cup was covered, but forthwith would have fallen down as *Dead*, and ſo would have lain a little time as in a *Sounding* or dead *Fit*; and then would have tumbled and toſs'd in the foreſaid violent Motions and Diſtractions of their Bodies, *Moaning* and *Groaning*; and ordinarily, the Eldeſt eſpecially, *Snarled*, *Barked*, and indeavoured to *Bite* like a *Dog*, they continued in this *Fit* for an *Hour* ſometimes, and ſometimes leſs, and ſo came out of the *Convulſive-like Motions*, lying as it had been in a *Sound*, a little before they came out of the *Fits*, and when they did come out of the *Fits*, would have cropen away in

a *Feared* manner from any who had been by them: and thus within an *Hour*, or little more, they come so out of their *Fits*, that they were also *Well*, and as much themselves as ever. They remained under these *Symptoms* until the middle of *September* every day taking the said *Fits*, in which they could not *Speak*, and in their Intermissions were as towardly and as well in their Wits as ever; And 'twas observable that they *both* took the *Fits* and came out of them at the same Time. But about the middle of *September*, about which time especially their *Barking* and *Snarling* like a *Dog* came, they became more *Wild*; so as for some *Days* now and then, even whilst out of their Torturing *Fits*, they would not endure any *Company*, no not so much as to come near one the other, and thus continued of this Disposition for a *Week*; and then the Eldest drew near his Father, saying as one surpriz'd, Father, *I am well*; and so he and the other became forthwith *Well*, and could look into *Water* without any *Fear*, and so continued to be *Well* for 3 or 4 *Days*, and after that fell *Ill* again, and remain'd *Ill* 6 or 7 *Days*, at the end whereof they both became *Well* as formerly on a *Suddain*, and from that time continued *Well*; only the Eldest about the end of *January* had some *Fits* like the former.

Observe, that in *August*, there were *Doses* of *Antimony* and *Mercurius Vitæ* prescribed, together with *Antidotes* of *Venice Treacle*, Powder of *Crabs Eys*, and other things.

XXXIX. 1. R. *Agrimony* Roots, *Primerose* Roots, *Dragon* Roots, Single *Peony* Roots, the Leaves of *Box*, of each a *Handful*; the *Star of the Earth* (or *Lychnis Viscosa flore muscoso*, *Casp. Bauhini*; or *Spanish Catch-Fly*;) two *Handfulls*; the black of *Crabs Claws* prepared, *Venice Treacle*, of each one *Ounce*; all these are to be beaten and bruised together, and boyl'd in about a Gallon of *Milk*, till the half be boyl'd away; then put it into a Bottle, unstrained, and give of it, about 3 or 4 *Spoonfulls* at a time, to the *Dog* or *Beast*, three Mornings together, before *New* and *Full Moon*. It will be necessary the day before you administer the *Medicine*, to take away a little *Blood*. Some of these Roots and Herbs being difficult to be gotten in the Winter, they may be gathered in their Season, and being dryed and well *Powder'd*, may be given mixt with the *Crabs Claws*, and *Venice Treacle*, with *Sallet Oyl* or *Butter*, and it will do as well.

Cures *for* Mad Dogs, *or any thing* Bit *by them*; *by Sir* Robert Gordon. n. 187. 298.

For *Men* or *Women* that are *Bitten* with *Mad Dogs*; take the same Ingredients in the same Quantities, and the *Roots* and *Herbs* being bruised altogether, with the *Crabs Claws* and *Venice Treacle*; let them be Infused warm into two Quarts of strong *White Wine*, for at least 12 *Hours*. This being strained, the party *Bitten* is to take about a *quarter* of a *Pint* Evening and Morning, 3 *Days* before the *New* and *Full Moon*; it may be sweetned, either with *Sugar* or some *Cordial Syrup*.

2. 1. Take *Virginia Snake-Root* and Flowers of *St. Johns-wort* gathered in their Prime, equal parts of each, let them be made into a very fine Powder. The *Dose* is from a *Scruple* to a *Dram*, and to be taken in any sort

Several Receipts *for the* Bite *of a* Mad Dog; *by Sr.* Theo. Mayern. n. 191. p. 409.

of *Decoction* prepared with *Specificks*. To a *Horse* give two *Drams*, to a *Dog* from 1 to $1\frac{1}{2}$ *Dr.* This before the *9th* Day after the *Bite*.

2. Take Leaves of *Rue* pickt from the Stalks and bruised, 6 *Ounc. London Treacle*, (or which is better *Venice Treacle*) *Garlick* pill'd and bruised, and fine *Filings* of *Tin*, each 4 *Ounces*; put them into 4 *l.* of *Canary*, or good *White Wine*, or in case of a nice or hot Constitution, into the same quantity of *strong* and well workt *Ale*, in an Earthen Vessel well stopt. Then let there be made a *Digestion*, or gentle Boyling thereof *in Balneo*, for 4 *hours*, shutting in the *Steam*, then press it and strain it. The *Dose* is from 2 or 3 *Ounces* (and in some Persons more) to be taken every Morning for 9 *Days*. The party *Bitten* must fast for 3 *Hours* after it, and the *Dregs* that remain after Expression must be bound upon the *Wound* received, renewing it every 24 *Hours* N. B. That the *9th Day* after the *Bite* must not be let slip, before this *Medicine* be taken, least the *Poyson* seize the *Blood* too strongly. It must be given Cold, or at least only a little Aired. A double Quantity may be a given to a *Beast*, soon after the *Bite*.

I never found this *Remedy* to fail. *Theo. de Vaux.*

3. Pluck the *Feathers* from the *Breech* of an old *Cock*, and apply it bare to the *Bite*, and do this upon each of the *Wounds*. If the *Dog* were *Mad*, the *Cock* will *Swell* and *Die*, and the Person *Bitten* will do well; but if the *Cock Dies* not, the *Dog* was not *Mad*. If the *Wounds* be very small, it is requisite to open them with a Lancet.

4. Let the Party be 9 *times* Plunged in the *Sea*, while he is *fasting*, as soon as may be after the *Bite*. Let the *Bitten* Part be washed with a *Lie* of the *Ashes* of *Oke-Wood* and *Urine*, and apply a Cataplasme of *London Treacle Alliaria*, or *Hedge Garlick*, *Rue* and *Salt*.

Take dried *Rue* and *Scordium* each 2 *Dr. Virginia Snake Root* $1\frac{1}{2}$ *Dr.* Flowers of *St. Johns Wort* 3 *Dr.* fine *Fileings* of *Tinn* and *Garlick* cut small, each 4 *Dr. London Treacle* 1 *Ounce*. Let them be all beaten and exactly mixt together, adding *Syrup* of *Lemon Pills* as much as suffices to make it into an *Electuary*; Divide this into 9 equal parts to be taken every Day one, Drinking after it a small draught of good *strong-Ale*. Let him walk upon it and not Dine till 4 *Hours* after. Use as little of the aforesaid *Syrup* of *Lemon Pills* as may be: and if that be not at hand, a *Syrup* made of *Malaga Wine*, adding as much *Sugar* as it can Dissolve, may serve the turn.

Make up of this *Electuary* $4\frac{1}{2}$ *Ounces* at a time, that so the *Dose* may be *half* an *Ounce*.

A Cure *for the* Bitings *of a* Mad Dog; *by Mr.* Geo. Dampier. n. 237. P. 49.

3. 1. I have sent you some of the *Herb* you desir'd. You must look for it in dry Grounds; Light and Sandy Ground where Sheep feed, doth commonly afford it; but my *Uncle* prefer'd that that grows on good Ground before any other. It is a sort of *Jews Ear*, which grows on the Ground as close as may be to it, being flat on it, the Moss and Grass groweth up about and amongst it. To use it, you must dry it in an Oven, by the Fire, or in the Sun, then powder it, and pass it through a Renge, or fine Sieve, the which mixed with the like quantity of fine beaten and powdered *Pepper*, is the *Composition*. When given to a *Dog*, the *Dog* must first be *Blooded*, and then

washt

Waſht well all over, the *Dog* being kept from Meat a convenient while before, then mix it well in a convenient Quantity of *Milk* or *Broath* warm. If it be for any *Cattel*, it muſt be alſo *Blooded* and well *Waſhed*, and given with a *Drenching Horn*, and the *Doſe* may be proportioned to the Bigneſs or ſtrength of the Creature that is to take it 1. To a *Man* or *Woman* it muſt be given after *Blood letting*, and well *Waſhing* the Face, and Hands, or place that may be *Bitten*, or all the Cloaths that the Perſon had on him or her, when *Bitten*, to *Waſh* away the *Snivel* or *Drivel* that comes from the *Mouth* of a *Dog* or other *Creature* when *Mad*, for that is the only Reaſon for *Waſhing*. A *Man* or *Woman* may take it in warm Milk, Beer, Ale, Broath, or how he beſt likes it, faſting, *two* or *three* ſeveral *Mornings* to make ſure.

After a *Dog* hath *Bitten Man* or *Beaſt*, it will not appear or begin to grow *Mad* till after a *full* and *New Moon*, or *New* and *Full*; but when it begins to be *Mad*, 'tis very hardly *Cured*. Therefore when you know any thing to be *Bitten*, or ſuſpect it to be ſo, uſe the *Remedy* as ſoon as may be after, and then, when given in time, it prevents all Signs of *Madneſs* at all, which hath made ſome indiſcreet People ſay it did no Good, they believe it would have done well enough without it: But my *Uncle* hath fully confuted that Miſtake ſeveral times, by not *Drenching* a *Dog* of ſmall worth in a Gentleman's Cry of *Dogs*, which hath Died *Mad*, and not one of the reſt Sick, but have followed their Maſter's Game rather better than before; and indeed being ingeniouſly prepared and given, 'tis a moſt *Noble* and *Infallible Medicine*. I was with my *Uncle* when a *Dog* had gotten in amongſt a whole Heard of *Cattell* at *Charmiſter* by *Dorcheſter*, and had *Bitten* ſome, which growing *Mad*, and feeding together with their Fellows, when *Mad* the *Driveling* of them *Infected* many more, and the Diſtemper continued almoſt all the Summer amongſt them ſtill one or two Dying, and *Infecting* more. The *Murrain* was at firſt ſuſpected, and the Cattel were Drencht for that Diſeaſe. But my *Uncle* being ſent for, he found 3 or 4 Sick, which he could not *Cure*, but ordered all the reſt to be driven 3 or 4 times through the great River, and all put from the ſame Paſture, till after it ſhould Rain a good Shower or two, which would *Waſh* away the *Snivel* from the Ground, and then *Drenching* them prevented any farther Evil, for not one was Sick afterward. The whole Heard was near 250, and about 40 Dy'd.

2. The *Simple* or *Herb* mentioned is not *Jews Ear*, but the *Lichen Cinereus Terreſtris*, deſcrib'd by Mr. *Ray*. It grows commonly in Barren places all over *England*. The Weight of one ſingle *Doſe* of this *Simple*, and the *Pepper* mix'd, Communicated to me by Mr. *Southwell*, with Mr. *Dampier*'s leave, is near ℈iv.

A Remark, by Dr. Hans. Sloane ib. p. 52. Hiſt. Plant. p. 117.

XL. A Judicious Perſon related to me, that being in the Country of *Otranto*, where the *Tarantula*'s are found in great Numbers, there was a Man who thinking himſelf *Stung* by one of them, ſhew'd in his Neck a ſmall *Speck* about which in a very ſhort time, there aroſe ſome Pimples full of a ſerous Humour; and that, in a few hours after, that Poor Man was ſorely afflicted with very violent *Symptoms*, as *Syncope*'s, very great *Agitations*, *Giddineſs* of the Head, and *Vomit*; but that without any Inclination at all to *Dance*, and without

Perſons ſuppoſed to be ſtung by Tarantula's; by Dr. Tho. Cornelio. n. 83. p. 4066.

without all desire of having any *Musical Instruments*, he miserably *Dy'd* within two Days.

The same Person affirm'd to me, that all those that think themselves *Bitten* by *Tarantula's*, (except such, as for some ends Fain themselves to be so,) are for the most part Young Wanton Girls, (whom the *Italian* Writer calls *Dolci di Sale*,) who by some particular Indisposition falling into this *Melancholy Madness*, perswade themselves according to the Vulgar prejudice, to have been *Stung* by a *Tarantula*. And I remember to have observed in *Calabria* some Women, who seised on by some such Accidents were counted (according to the common belief of that Province) to be Possess'd with the Devil.

This brings to my mind a terrible Evil, which often enough is observed in *Calabria*, and is called in their Language *Coccio maligno*. It ariseth on the surface of the Body, in the form of a small *Speck*, of the bigness of a Lupin. It causeth some *Pain*, and if it grow not soon *Red* thereupon, it in a very short time certainly *Kills*. 'Tis the common Opinion of those People, that such a Distemper befals those only, that have eaten Flesh of Animals Dead of themselves: which Opinion I can from Experience affirm to be false. So it frequently falls out, that of many strange Effects, we daily meet with, the true Cause not being known, such an one is assigned, which is grounded upon some Vulgar prejudice. And of this kind I esteem to be the Vulgar belief of the Cause of that Distemper, which appears in those that think themselves *Stung* by *Tarantula's*.

A Contumacious Jaundise, *attended with an odd Case in* Vision; *by Mr.* Samuel Dale. n. 211 p. 158.

XLI. I here send you an account of my Patient *Grace Dennis*, of *Braxted Magna*, in this County of *Essex*. About *Christmas* 1689. after much Grief and Trouble of Mind in the foregoing Autumn, the *Jaundise* began to appear upon her: for which, after having for about 9 *Months* used many Medicines, which were told her by divers of her Friends and Acquaintance, but without Success, She in *Sept.* 1690. applyed her self to me to whom I administred divers Medicines, famous in the most Celebrated Authors for the Cure of the *Jaundise*, and which I had often used with success in the Cure of that Disease, yet to her they were of no Benefit. After which she had the advice of several Learned *Physitians* in the Country, and likewise some in *London*: but all that cou'd be done for her hath not yet had any Effect; for her Disease yet continues, and her Body which used to be Plump and Fleshy, is now become Lean and Emaciated, almost like a Skeliton, and her Appetite is little and depraved.

In *May* 1691. After an extraordinary *Menstrual Flux* for about 3 *Months* she began as soon as the *Sun* was *down*, to be deprived of her *Sight* by degrees until it was quite Dark; when altho' never so big a Fire or many Candles were in the Room, yet could she not discern the Object (except a small shining of Light) and so she remained until the *Morning* as one Stone Blind, when by little and little, as the *Light* increased, her *Sight* returned, until the *Sun* arose, and then she recovered her perfect *sight*.

And in this Case she continued until *August* 1692. when being returned from *Epsom*, where she had been drinking the *Waters* for about a *Month*, her

Sight

Sight returned to her again, so that she could see in the *Night* perfectly. Thus she continued until *January* following, when an extraordinary *Menstrual Flux* again seizing her, her *Nocturnal Sight* likewise left her, and she became *Blind* again as formerly.

In *July* 1693. She was seized with a *Fever*, when her *Sight* again returned, and continued for about a *Month*, and then left her as formerly; so that now in *Octob.* 1693. She hath her *Noctural Blindness*, and the *Jaundise* likewise continues.

Divers Instances of Peculiarities *both in* Men *and* Brutes; *by Dr.* Nath. Fairfax. n. 29. p. 549.

XLII. 1. One Mr. *Moreley* of *Bury St. Edmonds*, in an *Asthmatick* Distemper, was advised by some to take down a Spoonful of good *English Honey*; which being done, the Patient fell into an Universal *Swelling*, as if he had swallowed the worst of *Poysons*, Mr. *Goodrich* (who is my Author) prescribed a common *Sudorifick*, which in competent time relieved him. And that they might be assur'd that there was nothing amiss in the *Honey* they afterwards got the like Quantity at another place, which was given with the very same frightful Event, and the Party was Cured with the same kind of *Sweat*.

By Mr. Oldenburgh. *ib.*

The like Example hath been more than once related to me by a very credible Person of a Noble Lady in *Ireland*, who having received a small hurt on her Leg, and the Chirurgeon (unkown to her) mingling in the Application, he made to it a little *Honey* (for which she had an utter *Aversion*,) the place affected did soon after Rankle and grow so bad, that the Lady was constrained to send for him that had applied it, who being acquainted with her *Antipathy* to *Honey* immediately removed that Plaister and apply'd another with good Success.

By Dr. Fairfax. *ib.*

2. Mr. *Twisse*, a Minister of *Metigham* in *Suffolk*, about 40 Years of Age, having been accustomed for some time to drink *Warm* or rather *Hot Beer*, being abroad about *Midsummer*, took off a Cup of *Cold Beer*, after he had taken a Pipe of Tobacco. He soon after found himself *Sick*, and *Vomited*, and coming home his *Vomiting* grew worse, and he was constrained to betake himself to Bed. Next Day he grew yet worse, and could find no help by Physick, but Died the very next Morning. And yet I am Informed that the same party could Drink *Cold Wine*: So that it was not the *Coldness* of Particles, sensible to the Touch that Kill'd him.

3. Madam *Mary Brook* of *Yoxford* hath such an Aversion to *Wasps*, that whilst their Season of Swarming about in Houses lasteth, she is forced to confine her self to a little close Chamber; and dares not then come out to Table, lest their coming there should put her into such *Distempers*, as *Cheese* doth those who have an utter *Antipathy* against it.

4. Mrs. *Raymund* of *Stowmarket*, when ever she hears *Thunder*, even afar off, begins to have a bodily Distemper seize on her; She grows Faint, Sick in her Stomach, and ready to *Vomit*. At the very coming over of it, she falls into a right-down *Cholera*, and continues under a violent *Vomiting* and *Looseness* as long as the *Tempest* lasts. And thus it hath been with this Gentle-Woman from a Girl.

5. I know a Woman in *Stow-Market*, who during her *Green Sickneſs* was invited by her *Pica* or *Longing* to ſuck the *Wind* out of *Bellows*, which as often as ſhe could, ſhe took into her Body with open Mouth, forceing it in, by Blowing with her own hands the *Bellows* inverted; I know another that was for *Crackling Cinders* under her Feet. From which kind of Inſtances I am inclin'd to doubt, whether that Diſtemper begins at the Depravation of the Acid Liquor in the *Stomach*, and not rather at the *Uterus*, which next Infects the *Brain*, ſuch kind of things gratifying the *Fancy* ſome ways miſled more than the *Appetite Natural* any ways Depraved.

6. Something like to this is to be found in *Brutes*. In *May* 1667. a *Greyh und Bitch* at *Britewell-Hall*, about 5 or 6 Days before ſhe caſt her Whelps, had ſuch a wild kind of *Hunger*, (though ſhe was fed ſufficiently every Day with uſual Food) that finding another *Bitch's Whelps*, ſhe *Devour'd* them all and fell next upon the Bitch her ſelf, who made a ſhift to get from her. From this, and from *Sow's Devouring* whole Litters of Pigs, I am prone to think otherwiſe of the *Longings* of *Teeming Women*, than is the common Opinion.

Several Obſervations on different Maladies; *by M.* Gaillard. n. 233. p. 717.

XLIII. 1. There was ſeen at *Tolouſe*, about the Year. 1685. an Infant who had 2. Heads; One was a ſort of a Bag, reſembling the *Hood* of a *Benedictine Monk*, and was faſtened to a *Neck* of the ſame length with the *Neck* of the other *Head*. Maſter *Peter*, ſworn Chirurgeon, opened it in Preſence of Mr. *Bayle* and Mr. *Carboneau* the Waters being let out, the *Swelling* vaniſht; the *Neck* did not ſo, that part of it which was next to its Original, and which had about the length of *two Inches* and a *half*, was made up of *Fleſh*. This Child *Lived* 15 Days.

2. In the Suburb St. *Cyprien*, near to the Hoſpital of St. *Joſeph* of *Grace*. Mr. *Soye*, a Skilful Surgeon, having opened the Daughter of a Cap-Maker, dead of the *King's Evil*, *April*. 1685. remarkt, that the *Glands* of the *Meſentery* were *Petrefied*, moſt of them were about the bigneſs of a Walnut, and others of a Small Nut; in ſome of them, being opened, he found about a Dozen of *Stones*.

3. Mr. *Bouſquet*, Citizen of *Tolouſe*, being Dead on the 8*th* of *Mar*. 1686 of a Continual *Fever*, and a *Spitting* of *Blood*, accompanied with a *Difficulty* of *Breathing*, Mr. *Delpech*, ſworn Surgeon, opened him, and found in the Right *Kidney* 3 little *Stones*, and ſome *Gravel*; going down the *Ureter*, which was much enlarged, he found a Tough *Stone*, of the bigneſs of a Bean, lodged towards the Lower Orifice of the ſame Paſſage; The *Lungs* ſtuck to the *Pleura*, to the *Mediaſtin*, the *Diaphragm*, and *Pericardium*; The *Wind-Pipe* was full of *Blood*; there was ſeen in the left Lobe, and the Back part of the *Lungs*, a *Bony* Subſtance 2 *Inches* long, and *half* an *Inch* broad: There were two *Polypuſes* in the *Heart*, one in each *Ventricle* of the bigneſs of a Pigeon's Egg, whoſe Roots were 10 *Inches* long, the *Vena Cava*, both *Aſcendent* and *Deſcendent*, was covered at its entry into the Left *Ventricle* of the *Heart*, with a *Bony* matter.

4. Mr

4. Mr. *Soye* having in *May* 1689. opened the *Vena Basilica* of the Right Arm of Mad. *de St. Paul*, a Religious of the Hospitalers of *Paris*, observed a little *Black Blood* that stopt the Orifice he had made, and being willing to take it away to open the Passage, he found that it was a *Polypus* 10 *Inches* long.

5. In *Sept.* 1687. the Sieur *Soye*, having in the *Hospitalers*, opened a Servant Maid, aged between 25 and 26, which was from time to time seized with a *Bloody Flux*, he found the *Colon* and part of the *Mesentery Ulcerated*. The Mouth of this *Ulcer* was so great, that one might easily thrust in his Fist at it. It was stopt with a Clew of *Worms* greater than it.

6. There happened much about the same time a Passage, singular enough, in that Monastery, M. —— having stopt on a sudden a Flux of Blood in Madam *Maria*, who had her *Catamenia* (though she had a Continual *Fever* and a *Bleeding* at the *Nose*) before he had used general Medicines, she fell all on a sudden into an *Apoplexy*, and Dying quickly after, M. *Soye* open'd her, and found in the Lateral *Sinus*, which divides the *Brain* from the *Cerebellum*, a *Clot* of *Blood* as big as a Hazel Nut. All the Vessels of the *Brain* were very much swelled and full of *Clotted Blood*; as for the *Ventricles*, they were full of a *Serous* Humour, being about the Quantity of a *Setier*.

7. Madam *le Gendre*, who dyed a Maid of 18 Years Old, about the end of *Nov.* 1693. was subject to great *Head-aches*, and almost Continual Faintings, and *Convulsive Fits*; and the two last Years of her Life, she was so strongly seized with them, that she became *Blind* of them, and continued in that Condition two or three *Months*. After Death she was opened by M. *Soye*; and when he came to the *Grey* Substance of the *Brain*, he found above the *Ventricles* between the *Cortical* Substance and the *Callous Body*, a *Lump* of *Flesh*, resembling the Stomach of a Goose. Immediately after the *Callous Body* in the foremost *Ventricles* did appear an *Ulcer*, from which came out about a *Setier* of Matter.

8. In the beginning of *Sept.* 1695. M. *Soye* opening the *Gall-Bladder* of a Widow of 19 Years old, he found there a *Stone* altogether like a Hen's Egg, that part of the *Liver* which was near, was Hurt, and her *Matrix* Schirrous. She had for 2 Years the *Yellow Jaundice*.

9. The same M. *Soye*, having in *Sept.* 1696. opened a Child of M. *Roye* Notary, found in the *Ventricles* of the *Brain* a *Setier* of *Water*.

10. In another Child of Mr. *Hugonien*, Woollen Draper, which he opened much about the same time, and which was about 2 Years Old, he found in the *Right Ventricle* of the *Heart*, a *Polypus* as big as a Pigeon's Egg, and in the *Left Ear Coagulated Blood* of the bigness of a Walnut; he found moreover in the little *Lobe* of the *Lungs* two *Ulcers* very distinct, from each of which there issued a *Setier* of Matter. The *Ureter* of the *Left Kidney* was distended an *Inch*, and its Passage stopt by *Phlegm*, so hardened that scarcely could a Knife cut it.

11. Madam *de l'Etcarre*, about 26 Years of Age, and subject to great Diseases, was opened in the beginning of *Oct.* 1695. by M. *Soye*; he saw

the Veſſels that brought the Blood to the *Membranes* of the *Brain*, were greatly ſwelled, and full of *Polypus's*; of them we drew out 12, ſome 4 *Inches* long, and ſome *three*.

12. In the Beginning of this Year. 1697. the Wife of M. *Maſoc*, Merchant, being 40 Years old, who had 4 or 5 Children, had the ſame *Symptoms* which happen to Women near their *Labour*. M. *Soye* was called to her, and ſeeing that ſhe ſuffered ſuch a Loſs as happens to Women before their bringing forth, or upon ſome Hurt, made ready for *Laying* of her. We ſaw preſently a *Falſe Conception*, which appeared at the Inner Orifice of the *Matrix*; This he pulled out, perceiving it looſe from its Ligaments. This *Falſe Conception* was of the bigneſs of a Gooſe Egg, and ſhap't like a *Kidney*: There was alſo ſo great a Similitude between the Structure of the *Kidney*, and this Maſs of Fleſh, that the Fibres were wholly alike. This Woman ſaid, that this *Falſe Conception* had been *two Years* in her *Matrix*. After it was out, ſhe had the ſame *Loſs* of *Blood*, as in her other *Lyings in*, and keeping to the ſame Courſe as ſhe uſed in ſuch Occaſions, ſhe had no bad Conſequences of it.

13. There was obſerved in a Child, newly Born, and in due time, that it had nothing of the *Bone* in the Hind-Part of the *Head*, the *Temporal Bones*, nor of the *Frontal Bone* as far as the *Eyes*; ſo that the *Eyes* made an appearance of two Horns, which the Calves have when they come into the World, which ſtanding much out, made the Child's Face very *Monſtrous*. In the *Temporal Bones* there was nothing ſeen but what encloſed the *Organ* of *Hearing*; upon laying the Hand upon it, was felt the *beating* of the *Arteries*, and the Veſſels which watered the *Pia* and *Dura Mater* were ſeen diſtinctly, as if the *Bone* had been taken off. This Child *Lived* in this State, 4 or 5 *days*.

14. M. *Soye* the Younger, a Surgeon, having opened a Young Girl, found her *Matrix* ſo *Schirrous*, that it ſeemed to be made but of One Piece.

15. The ſame obſerved ſince, ſuch a thing in a Girl 2 Years Old, that died of an *Apoplexy*; he found alſo 4 *Glands* in the *Meſentery* of this Maid, each as big as a Wallnut. He has ſince ſeen that the *Meſentery* of a Child 7 or 8 Years Old, was made of 2 *Glands*, each of the ſame bigneſs.

16. M. *Barriere*, Sworn Surgeon, found in a Girl 11 or 12 Years Old, inſtead of a *Matrix*, a very thin *Membrane* placed where the *Matrix* is. The *Vagina* in the outward Orifice was ſhut up Hermetically; *i. e.* the Cover was of the ſame Piece with the *Matrix*.

17. M. *Carlan*, ſworn Surgeon; having obſerved in a Man a *Swelling*, as big as a Pullet's Egg, upon the place called *Fontanella*, and covered with *Hair* like the reſt of the Head, applyed to it *Emplaſtrum de Betonica*, by order of M. *Dufaur*, Profeſſor of Surgery, and the *Swelling* diſappear'd.

XLIV. *Papers of Leſs General Uſe*, Omitted.

v. 35. *p.* 672. 1. SEveral *Anatomical Inventions* and Obſervations Aſſerted to their Proper *Authors*; by Dr. *Tim. Clark. viz.* 1. Of

1. Of the *Vasa Lactea*, to *Asellius*;
2. Of the *Ductus Thoracicus*, to *Pecquetus*;
3. Of the *Vasa Lymphatica*, to *Bartholinus* and *Rudbeckius*; yet these *Lymphaticks*, were observed in the *Testicles*, by *Jolive*, some Time before;
4. Of the *Circulation* of the *Blood*, to *Harvey*, not to *P. Paulus Venetus*;
5. Of the *Injection* of *Medicated Liquors* and other things into the *Veins* of Animals, to Sir *Chr. Wren* about the latter End of the Year, 1656. if not to Dr. *Potter* about 18 Years before.
6. In the Prosecution of this last kind of *Operations*, both Dr. *Clarck* and Dr. *Henshaw* attempted, about that time, the *Transfusion* of *Blood* from one Animal into another; but Unsuccessfully, till Dr. *Lower* hit upon a more Practicable Method, and *Perform'd* the *Operation* at *Oxford*. An. 1666.

2. Several Historical Passages, concerning the *Invention* of *Injection* into the *Veins*, and *Transfusion* of the *Blood* of Animals; by Mr. *Oldenburg*. n. 7. p. 128. n. 27. p. 489. n. 28. p. 529.
Where the *Invention* of the First is given to Sir *Chr. Wren*, and the *Successful Practice* of the Later, to Dr. *Lower*; except this Honour may be allow'd to *Libavius*, who indeed describes the Operation upon Men plainly enough (in his *Defensio Syntagmatis Arcanorum Chymicorum*, *&c.* p. 8. *Edit.* An. 1615.) but 'tis only to mock at it. n. 37. p. 731.

3 Queries and Trials proposed by Mr. *Boyle* to Dr. *Lower*, to be made by him, for the Improvement of *Transfusing Blood* out of one *Live Animal* into another. n. 20. p. 357. n. 22. p. 385.

4. A Letter from M. *Gasper de Gurye de Montpoly* to M. *Bourdelot*, concerning necessary *Circumspection* to be used in the Practice of *Transfusion* upon *Men*. n. 28. p. 517.

5. The *Cautious* Proceedings of the *English* in the Practice of *Transfusion* upon *Men*. n. 28. p. 521.

6. A Printed Letter of M. *Gadroys* to M. *Bourdelot*; being an Answer to a Paper of M. *Lamy*, and a Vindication of the *Transfusion* of *Blood* from his Objections. n. 30. p. 559.

7. A Printed Paper, written by *J. Denis*, touching a late Cure of an *Inveterate Phrensy* by the *Transfusion* of *Blood*; and the Proceedings of the *Court* of *Justice* at *Paris* upon the *Death* of the Man, after he had undergone that Operation twice or thrice. n. 32. p. 617. n. 36. p. 710. ib. p. 712. n. 54. p. 1075.

8. Experiments of *Staunching Blood* with the *Royal Styptique*; Extracted from M. *Denis*'s 11th. *Conference*, Printed in French at *Paris*. *Apr.* 30. 1673. n. 95. p. 6054.

XLV. *Accounts of Books*, Omitted.

1. MEmoirs for the Natural History of *Humane Blood*, especially the *Spirit* of that Liquor; by the Hon *Rob. Boyle*, Esq; *Lond.* 1683. n. 154. p. 428.
2. Apologia pro *Circuitione Sanguinis*; qua respondetur *Æmilio Parisano*, Medico *Veneto*: Auth. *Geo. Entio.* Editio altera, auctior & accuratior. *Lond.* 1685. in 8*vo*. n. 173. p. 1104.

n. 58. p. 1200. 3. *Joh. Sig. Elſholtii Clyſmatica Nova*; ſive Ratio in *Venam* Sectam *Medicamenta Immittendi. Coloniæ Brandeburgicæ.* 1667. in 8*vo.*

n. 4. p. 75. 4. Diatribæ, *Th. Williſii.* M.D. & Profeſs. *Oxon.* de *Febribus*, Vindicatio: Authore *Rich. Lower.*

n. 12. p. 210. 5. Dr. *Sydenham's Methodus Curandi Febres*, propriis Obſervationibus, ſuperſtructa.

n. 123. p. 568. 6. Obſervationes Medicæ circa *Morborum Acutorum* Hiſtoriam & Curationem; Auth. *Thom. Sydenham.* M.D. *Lond.* in 8*vo.*

n. 197. p. 657. 7. Novæ Hypotheſeos, ad Explicanda *Febrium Intermittentium* Symptomata & Typos excogitatæ Hypotypoſis: Una cum Ætiologia Remediorum, ſpeciatim vero de Curatione per *Corticem Peruvianum.* Acceſſit Diſſertatiuncula de *Inteſtinorum* Motu *Periſtaltico.* Auth. *Gulielmo Cole.* M. D. *Lond.* 1693. in 8*vo.*

n. 199. 717. 8. ΠΥΡΕΤΟΛΟΓΙΑ: Seu Exercitationes de *Morbis* Univerſalibus *Acutis* Auth. *Rich. Morton.* M. D. *Lond.* 1692. in 8*vo.*

n. 217. p. 123. 9. *Archibaldi Pitcarnii.* M. D. Diſſertatio de *Febribus.*

n. 73. p. 2210. 10. Diſſertationes duæ Medicæ de *Veneno Peſtilenti:* Studio *Caroli de la Font.* M.D. & in Acad. *Avenion.* Prof. Primar. *Amſtel.* in 12*o.*

ib. p. 2212. 11. *Franc. de le Boe Sylvii.* M. D. Oratio de *Affectus Epidemici*, Anno 1669. *Leidam* Depopulantis, Cauſis Naturalibus. *Lugd. Batav.* 1670. in 12*o.*

n. 81. p. 4028. 12. Λοιμολογία, Sive *Peſtis* nuperæ *Londini* Graſſantis Narratio Hiſtorica. Auth. *Nathan. Hodges.* M. D.

n. 101. p. 14. 13 *Medicina Militaris*; or a Bodie of *Military Medicines* experimented, by *Raymundus Mindererus: Engliſht* out of *High Dutch. Lond.* 1674. in 8*vo*

n. 136. p 918. 14. Tractatus Medicus de *Morbis Caſtrenſibus* Internis. Auth. *Joh. Valentino Willio. Hafniæ.* 1676. in 4*to.*

n. 226. p. 475. 15. An Account of the Nature, Cauſes, Symptoms, and Cure of the *Diſtempers* that are Incident to *Sea-faring People*; with Obſervations on the *Diet* of the *Seamen* in His Majeſty's *Navy*; Illuſtrated with ſome remarkable Inſtances of the *Sickneſs* of the *Fleet*, during Laſt Summer, Hiſtorically related. By *Will. Cockburn.* M. D. 1696. in 8*vo.*

ib. p. 478. 16. A Continuation of the Account of the Nature, Cauſes, Symptoms, and Cure of the *Diſtempers* that are Incident to *Sea-faring People.* Illuſtrated with ſome remarkable Inſtances of the *Sickneſs* of the *Fleet*, during laſt Summer, Hiſtorically related. To which is perfixt an Eſſay concerning the *Quantity* of *Blood* that is to be Evacuated in *Fevers*; being the 3d. part of the Work. By *Will. Cockburn.* M. D. *Lond.* 1697. in 8*vo.*

n. 228. p. 545. n. 226. p. 470. 17. *Marcelli Malpighii* Opera *Poſthuma*; Fig. æneis illuſtrata: quibus præfixa eſt Ejuſdem *Vita* à ſeipſo Scripta. *Lond.* 1697. in *Fol.*

CHAP.

CHAP. VI.

The Bones, Joints, and Muſcles.

I. I Have lately ſeen in *France* part of an *Humane Sceleton*, conſiſting of the *Os Ilium*, the *Os Sacrum*, the 5 *Vertebræ* of the *Loyns*, 10 of the *Back*, 5 entire *Ribs* on the Right ſide, and 3 on the Left; the bottoms or ends of the other were cloſely *united* to the tranſverſe *Apophyſes* of their *Vertebræ*; The *Vertebræ* of the *Neck*, the *Claviculæ* and *Sternum* were wanting. All theſe *Bones*, which naturally are 38 each ſeparate and diſtinct from another, were here ſo ſtraightly and intimately *joyned*, their Ligaments perfectly *Bony*, and their *Articulations* ſo effaced, that they really made but one uniform continuous Bone; ſo that it was as eaſie to break one of the *Vertebræ* into two, as to diſ-joynt or ſeparate it from the other *Vertebræ*, or the *Ribs*, or the *Os Sacrum* from thoſe of the *Ilia*. Nor could I obſerve any greater Diſtinction between all the *Bones*, than is uſually ſeen in Adult Perſons between the *Os Pubis*, the *Iſchion* and *Ilium*, which are but one entire Bony Subſtance. The Roots of all the *Ribs* made but one equal, ſmooth, and plain Superficies with the *Vertebræ* and their *Apophyſes*. The Obilque *Apophyſes* of all the *Vertebræ* were ſo confounded and loſt, that it was not poſſible to obſerve any marks of them. The *Cartilagineous* Edge of the *Vertebræ* themſelves was turned to perfect *Bone*. But when I had Saw'd two of the *Vertebræ* aſunder at the *Commiſſure*, I found this Uniting did not enter above two Lines deep, and that afterwards their middles were Separated as they uſually are, and touched each other only at the edges, which was raiſed up a little above the middle part. On the Left ſide at half a Finger's breadth from the *Vertebræ*, two *Ribs* were joyn'd together for the Space of an *Inch*, and afterward run ſeparated and parrallel like the reſt, to the *Sternum*. The Figure of this *Trunk* was crooked, and making part of a Circle, the *Spinæ* making the Convex, and the inſide of the *Vertebræ* the Concave part of this Segment. The direction of the *Ribs* was unnatural, for inſtead of terminating at the *Sternum* in parallel Semicircles nearly Horizontal, their Extremities, where they reached the *Sternum*, dipp'd ſo much down toward the *Hypogaſtrium*, as to touch the ſides of the *Oſſa Ilium*.

The Bones of a Sceleton United, without Jointing or Cartilage; by Dr. Bern. Connor. n. 215. p. 21.

This *Trunk* had been found in ſome Church-yard or Charnel-Houſe, as appeared by it's dark red Colour and Dryneſs, and ſeemed to be of a grown Perſon, the *Bones* being of a Proportion and Thickneſs equal to thoſe of Old Men. The *Vertebræ* of the *Loyns* were larger than thoſe of the *Back*, as they Naturally are; there was no unnatural Bunching out, their joyning together very regular, no one *Vertebra* ſtanding out beyond the other, either before, behind, or on the ſides. The Cavity for the *Spinal Marrow* had no Fault, but its bending Figure. The *Bones* of the *Os Pubis* were ſeparated as uſually. The *Socket*, or Cavity, of the laſt *Baſtard Rib* on the

Right

Right ſide being ſmooth and poliſht, ſeem'd as if that *Rib* had not been ſo firmly United as the reſt. In the extremity of the *Ribs* next the *Sternum*, the uſual Cavities for the *Cartilages* to move in, were obſervable, which as it ſeems by this were not *Bony*, nor continuous with the *Ribs*. It is hard to give a Mechanical Reaſon of this ſo ſecret and hidden a Matter. That theſe *Bones* were thus *United* after the death of the Perſon in the Ground is hardly to be allowed. Pure Earth, being made up only of friable porous irregular Particles, can but Suck up the Superficial Moiſture of the *Ligaments* of this *Trunk*, otherwiſe by Evaporation in the Sun *Ligaments* and *Cartilages* would become *Bony*; and the *Earth* is never ſo Styptique as to procure ſo intimate an Union. If you will ſay the Earth was impregnated with ſome Principle capable to produce this Effect, it muſt be either *Water*, *Sulphur*, or *Salt*; neither of which ſeem proper to Cement *Bones*: All knowing that *Water* and *Sulphur* are ſo far from Hardning Ligaments, that they rather ſoften and relax by their Slippery and fluid Particles. Nor are *Alkalis* or *Acids* capable to turn them to *Bone*: For *Alkali's* being Briſtly, Stiff, and Inflexible, are properer to Separate than Unite; as is ſeen by putting a piece of *Ligament* into any *Alkalin Salt*. And Secondly, *Acids* are moſt proper to break the Texture, and divide even the Hardeſt Bodies, and upon Experiment *Cartilages* are diſſolved in them; beſides could this effect have been produced in the Earth, why was not the whole Body turned to Bone.

As to the *Crooked and Bending Shape* of this *Sceleton*, it is reaſonable to ſuppoſe that it proceeded from the firſt formation of the *Fœtus* in the *Womb*, from the *Egg*'s not having Sufficient Room, or being accidentally preſt by ſome *Abſceſs* in the *Womb* or elſe where, ſo that the *Carina* of the *Back-Bone* inſtead of running ſtraight was bent into a Circle, and kept the ſame Figure when at full Growth that theſe *Bones* had taken when ſoft and tender. Hence the Scituation of the reſt may be fairly deduced; as the drawing down of the *Ribs* and *Sternum* to the *Oſſa Ilium*. And from theſe *Vertebræ* and other *Bones* being thus preſt upon each other, and ſo rendred unmoved, the cauſe of their being *united* into one *Bone* might be this, The *Pores* of ſuch tender Parts being eaſily ſtopt, ſo that the Blood and other Humours could not paſs, and upon that Account the *Cartilages* of the *Vertebræ* becoming dry, *United* into one piece. By the ſame Reaſon the *Ribs* being preſt againſt the *Vertebræ* for ſeveral Months, and without Motion in the *Womb*, could receive and admit little or no Moiſture between them, whence their *Cartilages* became Hard and *United*, and in time *Bony*, as ſeveral other *Bones* of the Body do, though they were but *Griſtles* when in the Womb.

From this Conſtruction of the Parts it neceſſarily follows, that the Body of this Perſon muſt have been *immoveable*; that he could neither *bend* nor ſtretch himſelf out, riſe up nor ly down, nor turn upon his Side, having only the Head, Feet, and Hands, *moveable*. If it be Objected, that *Reſpiration* could not be performed when the *Ribs* were thus *immoveable*; this Difficulty may be obviated by obſerving, how little motion of the Breaſt is neceſſary to continue the *Motion* of the *Blood* through the *Lungs*, as is viſible

ble in *Hysterick Fits*, *&c.* Again, the *Ribs* of this *Sceleton*, though fixt at the Center, might yet be moved at the ends, and so the *Thorax* enlarged by a much less Strength than that of the *Muscles* used for that purpose; Besides, the *Diaphragm*, the chief Organ of *Respiration*, in this Subject was free in the acting. But it is likely this Person *breathed* very *short*, the quickness of the Returns supplying the defect of a large Draught of *Air* at once: And possibly the *Foramen Ovale* might continue open, and that by it and the *Arterial Canalis* the *Blood* might pass from the *Cava* to the *Aorta*, but a part of it passing through the *Lungs*; as I have Lately observed in a Girle of 4 or 5 Years Old, in whom the *Foramen Ovale* was but half closed up, and in the form of a Crescent.

To this may be added another Observation of the *Bones* of the *Thigh* and *Leg* growing together in an Adult Person, the place of their *Joyning* being much more Solid than any other part. These *Bones* were so *bent* at the *Knee* as to make an Acute Angle, yet were they without any *Exostosis*, Rottenness, Fracture, or unnatural Figure. It is more Surprizing to find the *Knee*, whose Motion is free and large, to be thus *United*, than that of the *Ribs* of the *Sceleton* whose Motion is obscure and scarce Sensible. Some thought that this might proceed from an *Ulcer* in the *Knee*: but an *Ulcerous* Matter is very unfit for the *joyning* of the *Bones* together; and I have observed an *Ulcer* in the *Knee* making such Havock, that the *Thigh* and *Leg* hung together but by the *Skin*. These *Bones* seemed too Sound to suppose the Person had a Wooden Leg, which by continual Kneeling upon, might make the *Bones* Unite; besides, this Accident is no more likely to befall a Person using a Wooden Leg, than any other, since the *Muscali flexores & Extensores Tibiæ* act alternately in each Step, which is sufficient to hinder the Growing together of the *Joynt*.

This Union of the *Bones* seems also to proceed from some Accident in the Womb; perhaps the *Knee* of this *Fœtus* being too much bent and prest against the *Thigh-bone* was hereby *United*, after the same manner as we have before explained that of the *Back-bone* and *Ribs*.

Explication of the Figures.

Fig. 76. *a a a a*, *b b b b*, *c c*, The *Vertebræ* of the *Neck*, *Back* and *Ossa Ilium*, all *Joyned together*. *d d d d*, Several of the *Ribs united* to the *Back-bone*.

Fig. 77. *g g g*, The place where the *Os Femoris* and *Tibiæ* were *United*.

II. 1. *Nicholas Brodes*, of 30 Years of Age, having been afflicted for the Space of 10 Years with an Incessant *Head-ach*, (which for the last 12 Months before his Decease had been more Violent than formerly, and deprived him of his *Sight*) upon the 15th of *March*, 1697. was received into the *Hotel Dieu*. After his Head was shaved, there appeared a large *Tumor*, which extended it self over the Hairy Scalp. In the midst of the Left *Parietal-bone*, there was the Pulsation of an Artery, and a small Fluctuation, the rest of the Tumor being exceeding hard. *M. Dupre* fearing this might be an *Aneurism*, was unwilling to Open the *Tumor* till he was constrained to it, by the Importunate Intreaties of the Patient, who chose rather the Hazard of his Life, than any longer to endure so exquisite a Torment. As soon as an Aperture was made, there issued out a quantity of thick Concreted Blood, which

Bony Excrescencies *on a Human* Skull; *by M.* Dupre. *n.* 251. p. 138.

wet

wet the Bolſters at every Dreſſing. The 2*d.* day he felt a hard Body with his Probe, Looſe in the Fleſh, which being taken out, appeared to be a ſmall Fragment of a *Bone* exfoliated, reſembling a ſmall Comb-bruſh. Upon the 4*th.* Day the Patient Dy'd. In Diſſecting the Head, the *Tumified* part of the *Skull* appeared to riſe more than an Inch above the Sound *Bone.* The whole Swelling of the *Cranium* was made up of ſeveral Subſtances, not unlike little *Horns*, or innumerable ſmall Hollow Cones, with their points downwards; beſides a great Number of *Bony Fibres*, ſtraight, Stiff, and Pointed reſembling the *Teaſels* uſed by Cloth-Workers. In the next place there were ſeveral *Holes*, ſome of which perforated the *Skull*, others not. There was no Diſtinction of the *Sutures.* The *Meninges* were Mortified and Confounded together, and in part adhered to the *Eony Excreſcencies* of the Left *Parietal Bone*; nevertheleſs the *Brain* was Sound and Entire. The Inequalities of the inner Surface of the *Cranium*, reſembled Melted Metall pour'd down from a conſiderable height, on a light moving Sand; or the inſide of a *Grotto*, in which the Stones get out in an irregular manner. The whole Left Side had loſt its natural Figure, and the Right had only a few Impreſſions, made by the beating of the *Arteries* of the *Dura Mater.*

There was no appearance, on an exact ſearch, of any *Venereal Diſtemper* to be found, whence theſe *Excreſcencies* might be ſuſpected to proceed. It is therefore probable that the Blood-Veſſels of the *Diploe* might be burſt by ſome accidental Blow on the Head, or eroded by ſome Acidities of the Humours, and the Blood be Extravaſated in its Cells; This Stagnating, and by Degrees arriving to a very high Degree of Corruption, it is not much to be admired that the more Ponderous part, (by its great Acidity) ſhould diſſolve the Contiguous *Bone*; and after it has penetrated that, by Eroding ſuch nice and ſenſible *Membranes*, as the *Pericranium* and *Dura Mater*, cauſe exquiſite *Pains.*

To explain theſe Irregularities of the *Skull*, it may be conſidered that its upper Plate is compoſed of *Strata* of *Bony Fibres*, lying Parallel to each other, and of an Arched Figure. Now when the Volatile Acid Sublimes, and Diſſolves one end of the *Bony Fibre*, it muſt by its Elaſticity Spring up and become Erect on the other. If more of theſe happen to have thoſe ends which remain on the *Cranium* around one Point, they form the ſmall *Cones* abovenoted, by means of a *Viſcous Water* which Cements them together, and fills up their Interſtices: On the contrary, if they ſtart ſeparately they form a *Capillary* Appearance.

Remarks on theſe Excreſcencies; by Mr. Will. Cowper. *ib. p.* 140.

2. *Excreſcencies* not unlike this of the *Skull*, have been obſerved in moſt other *Bones* of the Body (the *Os Petroſum*, *Incus*, *Malleus*, *Stapes*, *&c.* not excepted) and the Diſeaſe is commonly call'd *Spina Ventoſa.* It is remarkable, that the *Bones* of *Children* and Young Bodies (eſpecially their Appendages) are more ſubject to the like Accidents, than thoſe in Years; by reaſon their *Fibrillæ* are much ſofter and apt to extend, whereby that part of the *Bone* it ſelf grows Tumid, and frequently becomes *Carious*; and this probably might give Occaſion for Impoſing the Name of *Pædarthrocace* on that Diſeaſe, which is vulgarly call'd the *Joynt-Evil.* When the *Cartilages* on the Extremities of *Bones* in their Articulations are Eroded (and their Appendages thus diſeaſed) the

the *Bony Fibres* ſometimes Germinate and *Unite* both Bones, in ſuch a manner that they afterwards appear to be one continued one, as I have ſeen in the *Hip* and *Thigh-bone*, and again in the *Thigh-bone* the *Tibia* and *Patella*, and frequently in the *Oſſa Tarſi*, *Metatarſi* and *Bones* of the *Toes*; many Inſtances of which are mentioned by Writers, in the *Vertebræ* and other *Bones*. This *Unition* of *Bones* at their Articulations, may alſo happen through a defect of the Mucilage.

The *Germination* of *Bony Fibres*, after any Peccant Matter has deſtroy'd ſome of them and relaxt others, is no more ſurpriſing, than the *Fleſhy Inequalities* we commonly meet with in Hollow Ulcers of the ſofter Parts, as in the *Membranes*, *Muſcles*, *Glands*, *&c.* Beſides the *Inequalities* on the Surfaces of *Bones* thus affected, and their being very much diſtended, I have frequently ſeen divers large *Holes* in them; (beſides thoſe for the Tranſit of the Blood Veſſels) ſome of which have paſt quite through them. The like has been obſerved in both Tables of the *Skull*, as M. *Dupre* has taken Notice, where part of the *Bone* has been diſſolved into an *Ichorous* Matter, which ſometimes has happen'd, and the *External Teguments* not been Injured.

Vid. Anat. of Hum. Bodies *Tab.* 93. *and Introd.*

III. 1. *Joſeph Shute* Clerk, Parſon of *Mary* (nigh *Plymouth*) in the County of *Devon*, Aged 81 Years, being a Temperate Man, and of a Healthy Conſtitution, perceiving that his Mouth, about 3 Months ago, was ſomewhat ſtreightned, found that he had a *New Tooth* (the 3d Grinder) being the innermoſt of the upper Jaw in the Right Cheek, which ſtill remains firm.

New Teeth *in* 2 Aged *Perſons*; *by* Mr. Colepreſs. n. 21. p. 380.

2. *Maria Stert* of *Benecliffe*, in *Plympton St. Mary* (near *Plymouth*) in *Devon*, Aged about 75 Years, an Healthy Perſon, having had 9 Children, about the 40th Year of her Age loſt 3 of her upper *Inciſores* or Cutters, the other drawn out, and ſo remained Toothleſs, as to them, for about 25 Years, when ſhe perceived that a *New Tooth* came forth (without any Pain) next the *Canini* of the Left Cheek: And about 2 Years after, another *Tooth* grew out likewiſe without Pain, cloſe by the former. The firſt whereof, never came to above half the length of her former *Cutters*, the latter ſcarce breaking the Skin: Both which yet proved ſerviceable, till about 6 Weeks ſince, when ſhe eating (no Hard, Cruſty, or Solid) Meat, that *Tooth*, which came out firſt, fell down into her Mouth, without any Looſeneſs before Hand perceived, or any Pain; which had not a *Phang* like other *Cutters*, but much leſs and ſhorter. The other abides firm, and ſerviceable.

IV. In the *Pall Mall* at *London*, Liv'd one *Clarke* (call'd the *Poſture-Maſter*) that had ſuch an abſolute *Command* of all his *Muſcles* and *Joints*, that he could *Disjoynt* almoſt his whole Body; ſo that he impoſed upon our Famous *Mullens*, who lookt on him in ſo miſerable a Condition, that he would not undertake his Cure. Tho' he was a well grown Fellow, yet he would appear in all the *Deformities* that can be imagined, as *Hunch-Back'd*, *Pot-Belly'd*, *Sharp Breaſted*; he *Disjoynted* his Arms, Shoulders, Legs, and Thighs,

A remarkable Inſtance of an abſolute Command *of the* Joints *and* Muſcles; by --- n. 242. p. 262.

Thighs, that he well appeared as great an Object of Pity as any; and he has often impoſed on the ſame Company where he had been juſt before, to give him Money as a *Cripple*; he looking ſo much unlike himſelf that they could not know him. I have ſeen him make his *Hips* ſtand out a conſiderable way from his *Loins*, and ſo High that they ſeem'd to invade the place of his *Back*, in which *Poſture* he has an extraordinary Large Belly. He turns his *Face* into all *Shapes*, ſo that by himſelf he acts all the uncouth, Demure, Odd Faces of a *Quaker's Meeting*. He began *Young* to bring his Body to it; and there are ſeveral Inſtances of Perſons that can move ſeveral of their *Bones* out of their *Joynts*, uſing them ſelves to it from *Children*.

The Great Tendon above the Heel, after an entire Diviſion of it, ſticht and Cured; by Mr. Will. Cowper. n. 252. p. 153. Fig. 78.

V. *Feb.* 1. $169\frac{8}{9}$. I was call'd to *Tho. Wheatly*, a Carpenter, Aged 30. Years, who had totally *Divided* the Great *Tendon* of the *Muſculi Gaſterocnemii* of the Left Leg, about 3 Fingers breadth above the *Os Calcis*. I found the upper part of the *Tendon* withdrawn from the Inferior at leaſt 2 *Inches*. I was obliged to Divide the external Teguments *a*, *b*, to come at the ends of the *Divided Tendon* A, B; This done, the firſt needle C, (with ſtrong Silk in it well wax'd) I paſt thorow the Body of the *Tendon* A, about half an Inch above it's Divided Extremity. The 2d Needle and Silk D, was thruſt thorough this Upper part of the *Tendon*, a litle under the former, leaſt the two Threads (or Silks) ſhould meet each other at their Decuſſation in the middle of the *Tendon*. Afterwards both theſe Needles were paſſed thorough the Lower part of the Divided *Tendon* B. The Foot being held extended, the two ends of the *Tendon* were applied to each other, by the Aſſiſtance of the Ligatures C, D, which were ſo tyed, as to keep the Divided parts cloſe together, whilſt the Foot remain'd in this Poſture. After the 4 ends of theſe Ligatures were cut off, I found it was neceſſary to bring the ſides of the divided Skin nearer each other with one ſingle ſtitch, a little above the Suture of the *Tendon*. This done, a Pledget of Lint dipt in *Balſam* of *Turpentine* was laid on the Wounds, and another large Pledget of Flax, arm'd with *Linimentum è Gummi Elemi* over it. After the Application of common Bandages, Bolſters, *&c.* I found it was neceſſary to place a thick piece of Paſtboard, of a convenient Arched Figure, on the Fore-parts of the Foot and Leg, to keep the part Inflected, and prevent any Motion of it, which might break out the *Stitches* in the *Tendon*. He complained very much in Paſſing the Needles through the Upper part of the Divided *Tendon*; tho' its middle and internal part at the Diviſion was ſcarce ſenſible of the Touch of my Finger: But he had no Pain in paſſing the Needles through the Lower part of the *Tendon*. After 14 Ounces of Blood was taken from his Arm, I left him on his Bed. Six Hours after (which was about 8 at night) I found his Pulſe ſomewhat quicker than before: He then took an Ounce of *Syrup de Meconio*. The next Morning I found him in no ill Condition. He told me he had got ſome Sleep that night, but was often awakened with Twitchings in the Calf of the Wounded Leg. The 3d. day after the Operation, I dreſt the Wound with the ſame Applications as before; only uſing a Fomentation, made of a Decoction of *Wormwood*, *Sage*, *Roſemary*, *Bay Leaves*, *&c.* On the 4th day after the Operation

tion, I found the Applications on the Wound very wet with a Serous Humour, commonly called a *Gleet*. On the *6th* Day the matter became somewhat thicker, and the Skin being a little distended about the Wound, I was obliged to divide the last mentioned Stitch, to admit of the free Discharge of the *Pus*, which on the two succeding Dayes became much thicker than before, and the *Gleet* consequently lessened.

About this time the two ends of the *Tendon* were not a little Dilated, and a white Slough appear'd on it, towards the upper part of the Wound; on which, instead of the *Balsam* of *Turpentine*, I applyed *Tincture* of *Myrrh*. Not many Days after, this Slough came off, and the two ends of the *Tendon* were overspread with a *Fungous* Flesh, by which I was assured, that its Blood Vessels and Nutritive Tubes, were not compresst by the two first Ligatures. Afterwards I made use of Dryer Applications than before; sometimes using Lint only, and at other times *Pulvis Terebinthinæ*. About 10 days after the Operation, I found one of the two Ligatures in the *Tendon* hanging loose, which I divided and drew out. Two or 3 days after, I found the other Ligature loose also, which in like manner I removed. The Part all this while being kept Inflected by the Pastboard abovementioned.

I was often obliged to apply gentle *Escharoticks*, to lessen the *Fungus* on the *Tendon*. In less than 30 days after the Operation, he went abroad very Lamely. And not many days after, he told me he had walkt round *S. James's Park*; on the *26th* of *March* following (which was within 8 Weeks after the Operation) he walkt from his Habitation in *Witchstreet* without *Temple-bar, to Greenwich*, and returned in a few Hours; He has since recovered all the *Motions* of his *Foot*, and shews very little Lameness in Walking, and is not in the least incommoded in working at his Trade.

It is a common Opinion, that *Stitching* divided *Tendons* is Hazardous, if not Impracticable: And tho' the Authority of some *Writers* would have prevailed with me, in some measure, to have an Opinion of the Success of such an Attempt, yet the Contradictions of others, of no less note, would have left me Dubious, had I not sometime since seen large *Blood Vessels* in the *Tendon* of a Horse's Leg; which at that time Convinced me, that *Tendons*, as well as *Bones*, and other Parts, would *Unite*, tho' they were quite Divided, in case the neighbouring Parts remain entire, if their two extreams could be Artificially applyed to each other, without compressing all or the greatest part of their *Blood-Vessels*. This Distribution of the *Blood Vessels*, is expresst in the annext *Figure* where one Trunk A, A, with its Branches *a*, *a*, to the *Fibrilla* of the *Tendon* B, B, is expresst: whether it was a *Vein* or an *Artery*, I could not discover in that Subject, but in all Probability, both those Vessels have the like Disposition in such Large *Tendons*. I am enclined to think the like Distribution of *Blood Vessels* is not to be found in the *Tendon* which was Divided in this present Instance; but that its *Blood-Vessels* pass into it and back again at its Internal side, next the *Muscles* of the *Toes* and *Tarsus*; which ought to be taken Notice of by the Operator in the like Case, and that he does not free it of its *Fat* and *Membranes* next those *Muscles*, least its Communication with the *Blood-Vessels* be destroyed. *Fg.* 79.

VI. *Accounts and Emendations of Books, Omitted.*

n. 194. p. 544. 1. *Osteologia* Nova, or ſome Obſervations of the *Bones, &c.* by *Clopton Havers*. M. D. *Lond.* 1691. in 8o.

Ph. Col. n. 2. p. 22. 2. De Ratione *Motus Muſculorum*; by Dr. C. An. 1664. *The Author here farther Explains his* Hypotheſis, *and obviates ſome Objections to it.*

n. 10. p. 176. 3. *Nic. Stenonis* de *Muſculis* & *Glandulis* Obſervationum Specimen; cum duabus Epiſtolis Anatomicis.

n. 27. p. 512. n. 32. p. 627. 4. Elementorum *Myologiæ* Specimen; ſeu *Muſculi* Deſcriptio Geometrica, Auth. *Nicolao Stenone. Florentiæ.* 1667. in 4o.

n. 213. p. 226. 5. *Myotomia Reformata*, or a new Adminiſtration of all the *Muſcles* of Humane Bodies; wherein the true *Uſes* of the *Muſcles* are Explained; the Error of former Anatomiſts concerning them confuted; and ſeveral *Muſcles* not hitherto taken notice of deſcribed. To which are ſubjoined, a Graphical Deſcription of the *Bones* and other Anatomical Obſervations illuſtrated with Figures after the Life. By *Will. Cowper* Surgeon. *Lond.* 1694. in 8o.

n. 251. p. 130. 6. An Account of 5 *Pair* of *Muſcles*, which ſerve for different *Motions* of the *Head*, on the firſt and ſecond *Vertebra* of the *Neck*; and of two *Ligaments*, one of which faſtens the *Head* to the firſt *Vertebra*, the other faſtens the Firſt to the Second. To which is annext the Hiſtory of an Uncommon Appearance of a *Humane Skull. By* M. *Dupre. But Mr.* Will. Cowper, *here ſhews that the Diſcovery of theſe* Muſcles *is not* New; *Moſt, if not All, of them being either Deſcribed by him in his* Myotomia Reformata *and other Anatomiſts, or only the Different Appearances of Known Muſcles in* particular Subjects: *To which he adds* 2 *exact Figures of the ſame* Bones *and* Muſcles, *done after the* Life.

n. 41. p. 833. n. 105. p. 101. 7. Tractatus 5 Phyſico-Medici, de *Sale-Nitro* & *Spiritu Nitro Aereo*; &c, de *Motu Muſculari & Spiritibus Animalibus*; de *Rachitide*: Auth. *Joh. Mayow L. L. D. Oxon.* 1674. in 8o.

n. 148. p. 222. 8. *Wilhelmi ten Ryne* M. D. &c. *Tranſiſilano-Daventrienſis*, 1. Diſſertatio de *Arthritide*. 2. Mantiſſa Schematica. 3. De *Acupunctura*. 4. Orationes tres ſc. de *Chymiæ* & *Botanicæ* Antiquitate & Dignitate; De *Phyſiognomia*; De *Monſtris. Lond.* 1683. in 8o.

n. 125. p. 621. 9. Two Treatiſes; The one, Medical of the *Gout*; by *Herman Buſchof* Senior of *Utrecht*. The other partly Chirurgical partly Medical, containing ſome Obſervations and Practices relating to ſome extraordinary Caſes of Diſeaſes in both Sexes; by *Hen. van Roonhuyſe*. *Engliſhed* out of *Dutch. Lond.* 1676. in 8o.

CHAP. VII.

Monsters.

I. IN the House of M. *Bourdelot* was shew'd a *Monster* in form of an *Ape*, having all over its Shoulders, almost to his Middle, a *Mass* of *Flesh*, that came from the hinder part of its Head, and hung down in form of a little *Cloak*. The Report is, that the Woman which brought it forth, had seen on the Stage an *Ape* so Cloathed: The most remarkable thing was, that the said *Mass* of *Flesh* was divided in four parts, correspondent to the Coat the *Ape* did carry. The Woman, upon Inquiry, was found to have gone 5 Months with Child, before she had met with the Accident of that unhappy Sight.

A Monstrous *Birth like* a Monkey *at* Paris; *by* M---------- n. 26. p. 479.

II. I have lately lighted upon a *Monstrous Birth* viz. *Twin-Females*, very handsome, but so fastned together by the *Breast*, that there was not discern'd but one onely Trunk of the Body; which having their Chin united together, seem'd to kiss one another. I open'd them at the *Navil*, which was Common to them both, and found that there was but *One Heart*, though greater and rounder than ordinary; so that Nature seemed to have United the matter of two into one. They had *Two Lungs*, and *One Stomach*, the *Pylorus* of which did strangely branch it self into Two Ranks in the Bowels. There was but *One Liver*, but big; for the rest, there were *Two Spleens*, *Four Kidneys*, *Two Wombs* full of a white matter like a concreted Semen, and *Two Vulva's* with their distinct *Hymens*.

Twins fastned *together at the* Breast; *by S.* Jac. Grandi. n. 58. p. 1188.

III. *Oct.* 22. 1679. One *Grace Batter'd*, of *Plymouth*, of honest Repute, and Mother of 5 Children, about 12 a Clock at Night began to have Travailling Pains; and near 4 a Clock in the Morning the Head of a Child came to the Birth: When the Midwife, putting her Hand to help off this, felt another, by its Heat and Motion Alive. This Birth had *Two Heads*, and *Two Necks*, as also the *Eyes*, *Mouths*, and *Ears*, suitably *Double*; *Four Arms*, with *Hands*, and as many *Legs* and *Feet*. There was to both but *One Trunk*; but *Two Back-Bones*, from the *Clavicles* to the *Hypogastrium*; and from the Shoulders down to the bottom of the Loins they were not Distinct, but Cemented and *Concorporated*, after this manner, The Right *Clavicle* or Channel-Bone of the Right-hand-Child (being long) joyn'd with the Left *Clavicle* of the Left-hand-Child. The *Ribbs* on the Face-side of both of them, by the *Cartilages* or Gristles were *United* without any intervening *Sternum* or Breast-bone; and so made a common *Chest* to them both: And the *Ribbs* of both on the Back part were *United* by the *Gristles*; and from the *Clavicle* down to the *Hypogastrium*, or bottom of the Belly there, were so *Conjoyn'd*, that they made but One common Belly with *One Navel-String* to them both; but from the *Hypogastrium* downwards they were *Divided*, and became *Two*, each having the perfect Parts of *Females*; they were exactly like one another; very well Featured, having also pretty neat

Twins fastned *together at the* Breast; *by Dr.* Will. Durston. n. 65. p. 2096.

and

and handsome Limbs. They had their Hair more than ordinarily thick, and about half an Inch long, and the Nails full grown. The Weight of this Birth was $8\frac{1}{4}$ *Pounds*; the Circumference of the Left Head was about 11 *Inches*, that of the Right being half an *Inch* less. The Circumference of the Trunk was about 16 *Inches* and $\frac{1}{4}$; and the length of both, from Head to Foot, was full 18 *Inches* and an half.

We found on Dissection *One Navel Vein*, and *One Liver*, but that was very large, with the *Bladder* of *Gall* seated in its usual place: but there were *Two Urinary Bladders*, *Two Wombs*, *Four Kidneys*, and *One Stomach*, with the *Oesophagus* or Gullet perforate and open from the Mouth of the left Head; but the *Oesophagus* from the Mouth of the Right Head descended no lower than a little above *half* an *Inch* of the *Mid-riff*, and there it ended. Whence it may be concluded, that the Right-hand-Child must have received its Nourishment by and from the Left-Child. There was but *One Colon* which terminated into two *Intestina Recta*. So there was but *One Mid-riff*, and above that, we could find little or no appearance of *Lungs*; but only a very Large *Heart*, (with two *Auricles*,) the Figure of which was not Conical, but like a Souldiers *Pera* or Snapsack, or the *Ventricle* or Stomach; and lying near under the *Clavicles* transverse, as the Stomach lyeth under the *Mid-riff* and *Liver*. We did also observe *Two Ventricles* with the *Tricuspid* or *Sigmoid-valves*; as also the *Vena Cava* and *Aorta* dependant, and also the *Aorta* ascending and Bifurcate towards each Neck, and then Bifurcate again.

The Mother is in in as good a Condition of Health, as women in Child-bed use to be.

A Twin-Female Infant United *below the* Diaphragm; *by Dr.* S. Morris. n. 138. p. 961.

IV. At *Petworth*, in *Sussex*, *Dec.* 20. 1677. one *Joan Peto*, a Butcher's Wife, after most acute Pains was by her Midwife delivered of a *Monstrous Female-Birth*. It had *Two Heads*. Both the Faces very well shaped. The Left Face looked Swarthy; and never Breathed. And the Left Head was the bigger, and stayed longer in the Bearing. The Right Head was perceived to *Breath*; but not heard to *Cry*. Betwixt the Heads was a Protuberance, like another Shoulder. The Breast (and *Clavicles*) very large; about 7 *Inches* broad. But *Two Hands*: And but *Two Feet*.

The *Brain*, in each Head, was very Large. The *Spina Dorsi*, from the Neck to the Loyns, was *Double*. There were also *Two Hearts*, one on each side the *Thorax*; The Left Heart the bigger. And *Two pair* of *Lungs*, one infolding each Heart. Those in the left side were blackish; the other looked well. The *Mediastinum* parted the *Two Hearts* one from the other. The *Aorta* and *Vena Cava*, below the *Diaphragm*, *Single*: the *Diaphragm* having only three Perforations, as is usual. But a little above it they were each *Divided* into Two Branches, distributed to the *Two Hearts* in the Figure of a Greek Y. The *Oesophagus*, in like manner, a little above the *Diaphragm*, *scil.* about the *Fifth Vertebra* was *Divided* into Two Branches, one Ascending up into each Throat. There were also *Two Stomachs* or *Ventriculi*; One shaped, as in a Natural Birth: The other, a kind of great Bag,

bigger

bigger than the Natural Ventricle. In which reſpect, it anſwered to the Panch in a Cow or Sheep: but, in regard of its place, rather to the *Reticulus*, or elſe to the *Abomaſum*; being at the one Orifice continuous with the true *Pylorus*, and at the other with the *Duodenum*. Within it was contain'd a Subſtance like *Meconium*, as is uſual in Children newly born. The *Liver* but *One*; but very great: and the *Cyſtis Fellea* proportionable. The *Spleen* alſo *One*; but Large. So were the *Inteſtines*; and all the parts of the *lower Ventricle*, eſpecially the Left *Kidney*. The *Uterus* of an uſual bigneſs; but the *Clitoris* Large.

The *Secundine* extraordinary Great, weighing about 8 *Pounds*.

V. I have ſeen a *ſtrange Birth* at *Hilbrewers* in *Somerſetſhire*. There are 2 things which ſeem to me probable. 1. That Nature deſigned and made Preparation for *Twins*. For, the *Joyning* of theſe Two Infant Bodies beginning at the *Navel*, each hath all its Parts below to the very Toes proper to it ſelf, and not only *Diſtinct* all along but *Separate*. Upwards beneath the *Breaſts* theſe Bodies part again, and then all is, as below, *Diſtinct* and *Separate*. They laid *Supine*, ſeem to have but *one Body* where Joyned; but when *turned*, there is a deep Furrow between both, each hath a *Diſtinct Spina Dorſi*, &c. each hath *Nipples* in their proper place reſpecting the ſeveral Bodies, but one of each is ſeen before, the other behind, reſpecting the whole; they do not *Wake* and *Sleep* together certainly, they *Suck* and *Cry* heartily, *Exonerate* apart freely, and are likely to *Live*, if the Multitudes that come to ſee them (ſometimes 500 in a day) do not occaſion the ſhortening of their Lives. They are *Chriſtened* by the Names of *Aquila* and *Priſcilla*, though both *Females*; they were Born by an eaſie Travel to the Mother (who had been 2 Years Infirm) on the 19 of *May*. 1681. She had had 5 Children before. 2. The other thing I obſerve as credible is, That this Accident might happen in ſome ſuch way as this: Near the Time of the firſt Formation of the *Fœtus*, the *Navel-Strings* of each chanced to be ſo *Joyned*, that all along from within the Bodies of the Children to the end terminating in the *Womb*, they might ſeem as *One*. The *Mid-wife* ſaid, the *After-Burthen* though but *One* was Triple in bigneſs to what is uſual; that the *Navel String* was very great, ſo that 'tis eaſie to conceive, there might be Diſtinct though Joyned *Umbilical Veſſels*, which in likelihood parted within that common *Navel*, whence each Body had a juſt Diſtribution of its Proper Veſſels. There was ſuch a Croud of People there, that I could not give my ſelf that Satisfaction I deſired, yet I thought it worth my Pains to ſee and underſtand thus much of this unuſual Accident. One in an adjoyning Pariſh told us, That an ancient Man Living there remembred his Wife (now dead) had about 40 Years ſince ſeen ſuch a thing in *Wales*, and that the Children Lived ſo long as to be able to talk to one another, and that into Tears, when the one thought what the other ſhould do when either ſhould happen to Dye; and that both Died together.

A Double Birth Join'd *at the* Breaſt, *in* Somerſetſhire; *by Mr.* A. P. *Ph. Col.* n. 2. p. 21.

VI. There

Two Monſtrous Births, *in* Scotland; *by Dr.* Geo. Garden. n. 175. p. 1156.

VI. There have been two *Monſtrous Births* this Year at *Aberdeen*, both *Females*: the firſt was two perfectly form'd Children above and below the Belly, having *Two Heads*, *Four Arms*, and *Four Legs*, only the Two Arms which ſtood next other were not perfectly formed into *Hands* and *Fingers*, the *Breaſts* beginning to *Joyn* thereabouts; there was but *One Belly*, tho' ſomewhat bigger than ordinary, *One Navel* and *Navel-ſtring*, ty'd to *One After-Birth*; yet there were *Four Buttocks*, *Two* Diſtinct *Fundaments*, and the *Two Privities* were Confounded together. 'Tis thought they might have been brought forth Alive, but that they ſtaid ſo long in the Birth, for that both Heads preſenting together, the Midwife thought they had been *Twins* and thruſt one of them always back.

The other had all the due Proportions of One Child, the *Head* excepted; it having *Two Heads*, the one ſtanding behind the other, the foremoſt leſs than the due Proportion, and bowed down upon the Breaſt having Yellow Hair, and wanting nothing of the due Proportions of the Face ſave one Cheek beneath the Eye; the other bigger than ordinary, ſtanding ſomewhat Higher, having no Face, which they ſuppoſed to have been disfigured by the back part of the foremoſt.

A Monſtrous *Boy*; *by* S. Jac. Grandi. n. 58. p. 1189.

VII. I have lighted upon a *Monſtrous* Boy, terrible to behold, born with his *Breaſt* open, the *Bowels* out of the Belly, the *Legs* Diſtorted, the *Bladder* in the place of the *Fundament*; in the *Genitals*, beſides that the *Teſticuli* were cloſe to the *Kidneys*, there was nothing but a *Membranous Expanſion* wherein the *Spermatick Veſſels* were loſt.

A Monſtrous *Child*; *by* M. Chr. Krahe. n. 160. p. 599.

Fig. 80.

VIII. *Feb.* 29. 1684. at a Village call'd *Heiſagger* near *Hattersleben* in *South Jutland*, A Soldier's Wife was delivered of this *Monſtrous* Child: It is ſuppoſed ſhe had ſeen ſome Body Wounded or disfigured in the ſame manner, as it doth appear at the Child's Leg or Foot. At the Left Leg, 1. There was to be ſeen an Oblong Round piece of Fleſh of a Brown and Blew Colour, at the Extremities ſomewhat ſharpen'd, which was joyn'd to the Calf of the Leg, 2, and could be moved or put out and in from 1, to 3, that other piece of Fleſh 4, was of the ſame Colour, but faſtned to the Leg, ſo that it could not be diſplaced. At the Right Foot it hath 6 Toes; 7, was like a Bullet of a Piſtol, which did hang looſely to the Leg; 8, another Bullet ſomewhat bigger. The Face did look pretty Old, as if it had been of 35 or 40 Years of Age. 5, and 6, at the Forehead there had been obſerved ſuch *Excreſcencies* as if it were *Artificial Laces*: which the Painter, who 3 days after it was dead did draw the Scheme, teſtifieth to have been almoſt ſpoil'd or rotten by the touching of ſo many 100 of People that went to ſee this Creature. But before, when the Head of the Child was turned againſt the Light of the Sun, theſe Phyſical *Laces* ſeem'd to be very Artificially done. With the *Left Eye* it did look fiercely, keeping the other cloſe. Behind the *Head*, there was a ſhape like a *Hood*, or other Ornament, which Women commonly do wear. His *Arm* was figur'd like as the Scheme ſhew-

eth,

eth, with ſeveral Knots or Joynts. The *Tail*, which was ſtrangely grown out of the back part, 9, was a quarter of a *Zealandiſh Ell* long. The Mother of this Child being aged about 40 Years, hath had formerly 2 other Sons, now of 7, and 9, Years of Age, which are very well ſhaped and ſtill alive: but this *Monſter*, after it had *Cried* out 2 or 3 times, Died preſently.

IX. *Hermaphrodito*, quem deſcriptum eo, nomen eſt *Anna Wilde*; natus vero eſt (condonandus enim *Hermaphrodito* Solœciſmus) Menſe *Februario*, ipſo *Purificationis Feſto*, Anno Salutis 1647. in Pago non ignobili Agri *Hamptonienſis*, Vulgò *Ringwood*. Sexto Ætatis Anno inter ſaltandum Colluctandumque cum pueris coætaneis (quos omnes Viribus facile ſuperabat) Extuberationes duæ, *Herniarum* inſtar Βεβωνοκηλῶν dictarum, primum emicuêre; quibus in Ordinem redigendis (id enim illis animi erat) Chirurgi diu Operam luſerunt; *Teſticuli* enim erant, qui jam prægrandes facti, *Scrotis* cutaneis, corrugatis, piliſque obſitis incluſi, non alio diſcrimine à Virilibus naturaliter ſe habentibus diſtinguntur, quàm quòd ſinguli *Teſtes* ſuo proprio diviſoque ab invicem hic *Scroto* gaudeant, ita tamen elongato, ut ex utriuſque Productione confingantur *Labia Vulvæ*. In Sinu Muliebri *Nymphæ* & *Caruncula Myrtiformes*, integræ ſatis ſe produnt: Quin & Membranula quadam, à *Perinæo* ſurſum tendente, media pars *Vulvæ* tegitur. *Clitoris* non apparet. *Uterus* ejuſque Cervix à Communi ſequioris Sexus Lege ne minimum quidem recedunt. Uſque ad tertium ſupra decimum ætatis annum pro *Fœmella* habitus, & *Fœmineo* Veſtitu indutus, munera illi Sexui deſtinata inter *Fœminas* aſſidue obibat. Cum forte vero Pani ſubigendo ſtrenuam navaret Operam, en derepente *Priapus*, ad id temporis latens, magno cum Impetu foras prorupit, accedente non levi ipſius Μεταμορφομένε ſtupore. Erectus *Penis* quatuor circiter pollices æquat. Locum Virgæ Virilis ipſiſſimum occupat; in *Glandem* pariter deſinit, *Præputio*, quod illi etiam Frænulo, ut in *Viris* fit, annectitur, inſtructum: Sed *Glans* imperforata (ita tamen ut tenuis Membranula eam obturans facile pertundi poſſe videatur) *Semine* per *Urethram*, ceu potius Virgæ canaliculum, viam affectanti, exitum negat; unde per Pudendum Muliebre (refluum forte) excernitur.

An Hermaphrodite, *at* London; *by* Dr. Tho. Allen. *n.* 32. *p.* 624.

Cum Annorum eſſet 17, *Menſtrua* periodice & modo debito fluere cæperunt, atque per Biennium perſeverarunt. Quo elapſo, iiſdem non amplius comparentibus pullulavit *Barba*, & exinde totum Corpus *Piloſum* conſpicitur; Vox Corporiſque Habitus *Virilem* æmulantur, Crinis ſe habet *Virorum* ad inſtar: *Mammæ* nullæ exſurgunt; *Papillæ* perquam exiguæ. *Pectus* Latum eſt. *Iſchia* non ita diſſita. *Nates* quam ſunt *Fœminarum* contractiores.

Se ad utrumque Sexum comparatum aſſerit, ſed *Fœminis* miſceri præoptare; quas etiam cum videt, & concupiſcit, Erigitur *Penis*, qui quoties *Virum* appetit, Flaccidus manet. Unum hoc, idque nec extra Oleas putem, Coronidis loco ſubnectam; Quod nempe, cum nocte quadam, quam totam Tripudiis, Comporationibus, cæteriſque id genus Laſciviæ Incitamentis, cum aliquot ejuſdem Farinæ Congerronibus inſumpſerat, Oculos in *Virum* quendam

Formæ Venuſtioris conjecerat, mox eum adeo deperibat ut ſequenti die, præ Amoris œſtro, in *Paſſionem Hyſtericam* incideret, quam revera talem fuiſſe, non ſolum *Elevatio Abdominis, Cantus, Riſus, Fletus,* (notiſſima illius Intemperiei Symptomata) ſed & Juvantia, ſatis liquido comprobarunt : Applicato quippe *Emplaſtro ex Galbano* Regioni Umbilici, exhibitiſque Remediis *Hyſtericis* illico convaluit.

An Hermaphrodite, *at* Tholouſe ; *by* M. Veay. n. 186. p. 282.

X. *Nov.* 1686. On apporta a *l' Hoſpital S. Jacques,* une Servante malade *Hermaphrodite.* Elle a êté Baptiſée en qualité de *Fille,* ſous le Nom de *Marguerite.* Son Pere eſt pauvre homme de *Pourdiac,* a 7 lieues de *Tholouſe* qu' on appelle *Malauſe.* Elle eſt agée 21 a 22 *Ans,* ayant bien la Mine Exterieure d' une *Fille,* mais les marques réelles d' un *Homme* bien puiſſant. Son Viſage eſt *Femenin* & aſſez agreable, la *Gorge* bien Jolie, & les *Mammelles* auſſi bien faites qu' on les puiſſe deſirer à une *Fille,* les *Feſſes* & les *Caiſſes* grandes comme aux *Femmes,* les *Parties Honteuſes* tout comme celles d' une *Femme,* mais elle n' eſt percée que de la profundeur de deux petits travers de doigts ; & au milieu de cette fente, il pend un *Membre Viril* d' une groſſeur fort conſiderable, & qui dans l' Erection luy ſort au dehors d' environ 8 *pouces.* Ce Membre eſt bien formé, hormis qu'il n'a point de *Prepuce,* & qu'il n' eſt pas accompagné de *Teſticules* apparens. *L'Urine* & la *Semence* en ſortent comme aux *Hommes,* & ce qu'il y a de particulier c' eſt que le *Sang Menſtrual* coule auſſi par ce méme conduit de la Verge.

J' aurois eu de la peine a le croire, ſi je ne l' avois veu moymème, & Examiné fort exactement dans le temps que ces *Menſtrues* couloient, lesquelles luy ſurviennent preſque tous les Mois aſſez regulierement, ne paſſant gueres Deux Mois de temps ſans les avoir ; mais preſque toujours avec de Grandes Douleurs & une Tenſion au bas Ventre qui marque une eſpece d' Inflammation dans ces Parties.

J' ay fait voir cela a pleuſieurs de nos Medicins, & apres avoir conſulté Meſſieurs les *Vicaries Generaux,* nous luy avons fait prendre un habit d' *Homme* ſous le Nom d' *Arnaud Malauſe* ; & on va preſentement luy faire apprendre quelque Metier. Il n' y avoit pas a heſiter la deſſus, parce que notre *Hermaphrodite* peut fort bien faire la fonction d' *Homme,* & point du tout celle de *Femme.*

CHAP. VIII.

The Period of Human Life.

An Anatomical Account of Tho. Parre ; *by Dr.* Harvey. n. 44. p. 886.

I. THO. *Parre* was a Poor Countryman of *Shropſhire,* whence he was brought up to *London* by *Tho.* Earl of *Arundel* and *Surrey,* and Dy'd at the Age of 152 *Years* and 9 *Months.* Being open'd after his Death (*Nov.* 16. 1635.) his Body was found yet very Fleſhy ; his Breaſt Hairy ; his

his Genitals unimpaired, ſerving not a little to confirm the Report of his having undergone publick Cenſures for his *Incontinency*, eſpecially ſeeing that after that time, *viz.* at the age of 120 Years, he Married a Widow who own'd *Eum cum ipſa rem habuiſſe, ut alii Mariti ſolent, & uſque ad* 12 *Annos retro-actos Solitum cum ea Congreſſum frequentaſſe.* Further, He had a large Breaſt, *Lungs* not Fungous but ſticking to his Ribs, and Diſtended with much Blood; a Lividneſs in his Face, as he had a *Difficulty* of *Breathing* a little before his Death, and a long-laſting *Warmth* in his Armpits and Breaſt after it (which Sign, together with others, were ſo evident in his Body, as they uſe to be in thoſe that Die by *Suffocation.*) His *Heart* was Great, Thick, Fibrous, and Fat. The *Blood* in the *Heart* Blackiſh and Dilute. The Cartilages of the *Sternum* not more *Bony* than in others, but *Flexile* and Soft. His *Viſcera* very ſound and ſtrong, eſpecially the *Stomach*; and it was obſerv'd of him that he uſed to Eat often by Night and Day, though contented with Old Cheeſe, Milk, coarſe Bread, ſmall Beer, and Whey, and which is more remarkable, that he did Eat at Midnight a little before he Dy'd. His *Kidnys* were cover'd with *Fat*, and pretty Sound; only in the Anterior Surface of them there were found ſome Aqueous or Serous (as 'twere) *Abſceſſes*, whereof one was near the bigneſs of a Hen-Egg, with a Yellowiſh Water in it, having made a roundiſh Cavity, impreſſed in that *Kidney*: whence ſome thought it came, that a little before his Death a *Suppreſſion* of *Urine* had befallen him; though others were of Opinion, that his *Urine* was *Suppreſſed* upon the Regurgitation of all the Seroſity into the *Lungs*. Not the leaſt appearance there was of any *Stony* matter, either in the *Kidneys* or *Bladder.* His *Bowels* were alſo Sound, a little Whitiſh without. His *Spleen* very little, hardly equalling the bigneſs of one Kidney. His *Brain* was Entire and Firm: and though he had not the uſe of his *Eyes*, nor much of his *Memory*, ſeveral Years before he dy'd; yet he had his *Hearing* and *Apprehenſion* very well, and was able even to the 130 *Year* of his *Age* to do any Husband-man's Work, even Threſhing of Corn.

In ſhort, all his *Inward parts* appear'd ſo Healthy, that if he had not changed his Dyet and Air, he might perhaps have Lived a good while longer. But coming out of a Clear, Thin, and Free Air, into the Thick Air of *London*, and after a Conſtant, Plain, and Homely Country-diet, being taken into a Splendid Family, where he fed High, and Drunk plentifully of the beſt Wines; whereupon the natural Functions of the Parts of his Body were overcharged, his *Lungs* Obſtructed, and the Habit of the whole Body quite Diſorder'd; upon which, there could not but ſoon enſue a *Diſſolution.*

The great Age of Henry Jenkins; *by Mrs.* Anne Savile. *n.* 221. *p.* 266.

II. 1. When I came firſt to Live at *Bolton*, I was told ſeveral particulars of the great *Age* of *Henry Jenkins*, but I believed little of the Story for many Years; till one Day coming to beg an Alms I deſired him to tell me truly how *Old* he was. He paus'd a little, and then ſaid, that to the beſt of his Remembrance he was about 162 or 3; and I ask'd, What Kings he remembred, he ſaid *Henry* VIII. I asked, what *Publick thing* he could longeſt Remember? he ſaid, *Plowden-field*; I asked, whether the King was there,

he said no, he was in *France*, and the Earl of *Surrey* was *General*. I asked him how Old he might be then, he said, I believe I might be between 10 and 12; for, says he, I was sent to *Northallerton* with a Horse Load of Arrows, but they sent a bigger Boy from thence to the Army with them. All this agreed with the History of that time; for Bows and Arrows were then used, the *Earl* he named was *General*, and King *Henry* VIII. was then at *Tournay*: and yet it is observable that this *Jenkins* could neither Write nor Read. There were also 4 or 5 in the same Parish that were reputed all of them to be an 100 Years Old, or within 2 or 3 Years of it, and they all said he was an Elderly Man ever since they Knew him; for he was Born in another Parish, and before any Registers were in Churches, as it is said; he told me then too, that he was Butler to the Lord *Conyers*, and Remembred the Abbot of *Fountains-Abby* very well, before the *Dissolution* of the *Monasteries*.

By Dr. Tancred Robinson. *ib. p.* 267.

2. *Henry Jenkins* departed this Life *Dec. 8th.* 1670. at *Ellerton* upon *Swale* in *Yorkshire*; the Battel of *Flowden-field* was fought *Sept.* 9. 1513. And he was about 12 Years Old when *Flowden field* was fought. So that this *Henry Jenkins* Lived 169 Years, *viz.* 16 longer than Old *Parre*, and was the Oldest Man Born upon the Ruins of this Postdiluvian World.

In the last Century of his Life, he was a *Fisherman*, and used to wade in the Streams; his Diet was Coarse and Sower; but towards the latter end of his Days he Begged up and down; he hath Sworn in *Chancery* and other *Courts*, to above 140 Years Memory, and was often at the *Assizes* at *York*, whither he generally went on Foot: And I have heard some of the Country Gentlemen affirm, that he frequently Swum in the Rivers after he was past the Age of 100 Years.

By Mr. Hill. *n.* 128. *p.* 543.

3. In the *King's Remembrancer's Office* in the *Exchequer*, is a Record of a Deposition in a Cause by English Bill, between *Ant. Clark* and *Smirkson*, taken *April* 1665, at *Kettering* in *Yorkshire*, where *Henry Jenkins* of *Ellerton* upon *Swale* Labourer, Aged 157 Years, was produced and Deposed as a Witness. Divers very antient Witnesses Swore him to be a very Old Man when they first knew him.

Several very Aged Persons in the North of England; by Dr. Mart. Lister. n. 160. *p.* 597.

III. 1. *Rob. Montgomery* now (in the Year 1670) living at *Skipton* in *Craven*, but born in *Scotland*, tells me that he is 126 *Years* of Age; the oldest in *Skipton* say, that they never knew him other than an old Man; he is exceedingly Decay'd of late, but yet goes about a Begging.

2. *Mary Allison* of *Thorlby* in the Parish of *Skipton* Dyed 1668, Aged about 108. She Spun a Webb of Linnen Cloath a Year or two before she dy'd.

3. *J. Sagar* of *Burnley* in *Lancashire*, about 10 Miles off *Skipton*, Dyed about the Year 1668, and was of the Age (as is reported) of 112.

4. *Tho. Wiggen* of *Carlton* in *Craven* Dyed 1670 at the Age of 108, and odd *Months*: He went about till within few Weeks of his last, and was a very fair Corps.

5, 6. *Frances Woodworth* of *Carlton* Dyed 1662. of the Age of 102, and some

ſome odd *Months*: the Mother of 7 Children, always a very Lean Woman, yet to her very laſt went about as ſtreight and upright as a Young Girle, and of perfect Memory: her *Sight* and *Hearing* Decay'd, though not wholly deprived of either. This by Information from her Son *Robert Woodworth* now (in 1670) Living in *Carlton*, of the Age of 69, as able a Man to Ditch and Plough as any in the Town.

7. 8. *Will. Garthorp* and *Will. Baxter* of *Carlton* inform me, that they two being upon the Jury at *York* 1664. they ſaw and ſpake with, in the *Aſſize-Hall*, two Men, *Father* and *Son* Summoned as Witneſſes in ſome Cauſe or other out of *Dent*, a ſmall Valley in *Craven* 8 Miles beyond *Settle*: the *Father* told them, that he and his *Son* made 12 Score between them, and that his Son was above 100, and that He wanted not half a Year of 140. He told them further that he could and did make *Fiſh-Hooks* as ſmall as would take a Trout with a ſingle Hair. They obſerved that the *Son* looked much Older, and had the Whiter Hair. N. B. It is to be obſerved that the *Food* of all this *Mountainous Country* is exceeding Coarſe, as Salted and Dryed Beef, and Sowr-leavened Oat-bread. I am confident many Scores of Perſons might be found of the Age of 100 Years among theſe *Northern Mountains*.

IV. 1. My Lord *Bacon* ſays, That the *Counteſs* of *Deſmond* in *Ireland* was 140. Years of Age.

The great Age of 2 Perſons in Ireland; by Dr. Tho. Molineux n. 261. p. 502.

2. Mrs. *Eckleſton*, who liv'd ot *Philipſtown* in the *King's County*, was Born in the Year 1548. and Dy'd 1691. ſo ſhe was 143. *Years* Old.

V. After I had often Reflected upon the General Cauſes of Diſeaſes that lead to *Death*, I mean thoſe of the *Debilitation* of *Nature's Strength* in the Courſe of Man's Life, until its utter Extinction, and of the Cauſes of a meerly *Natural Death*, by the Failure of that Strength in an extreme *Decrepit Age*, without the Concurrence of any Exceſs or External Cauſe; I have entertain'd ſome Conjecture, that if we were more Intelligent in this Matter than we are, we might procure for our ſelves an *Age* of *Continual Youth*; ſetting aſide the ſeveral Accidents of *Divine Providence*, and meerly conſidering the *Forces* of *Nature*, not only not hinder'd, but alſo Aſſiſted as much as may be.

Longævity, and the Cauſes of Natural Death; by M. de Martel. n. 58. p. 1179.

Searching therefore for the true Cauſes of *Old Age*, and of *Natural Death*, I was not Satisfyed with that *Extinction* of *Natural Heat* and *Deſiccation* of the *Radical Humour*, aſſigned to be the Cauſe thereof, nor with the Cauſes of this *Extinction* and *Deſiccation*, that are commonly alledged; it being ſuppos'd, that this *Hot* and *Moiſt* Principle of Life, in its own Nature Diſſipable in the Courſe of Life not being perfectly repaired by Food, is conſiderably Diminiſht, which brings *Old Age*, and is at laſt quite Conſumed, which cauſeth *Natural Death*; where Authors make a great difference between the *Seminal Heat* and the *Moiſture*, and that which comes from *Aliments*; ſo that, *ſay they*, the former cannot be repaired by the latter, as being Heterogeneous. Which to me ſeems not to be true; for doth not this *Seminal Heat* and *Moiſture* originally

originally proceed from what is Superfluous of the 3d *Concoction* of the *Aliments*? It is therefore of the ſame Nature; and nothing hinders, but what is Diſſipated thereof may be perfectly Reſtored by good Nouriſhment, well prepared, and taken ſeaſonably and in due quantity. Whence it may be juſtly concluded, that the Defect of Repairing this *Principle* of *Life* comes not from its Nature, not Reparable this way, but from ſomething elſe.

The Illuſtrious *Bacon* conceived, that this fault came from the Unequal Reparation of the Liquid or Soft, and the Dry or more Solid Parts, which joyntly ſerve to Maintain and Repair themſelves; whence it comes to paſs, that the moſt eaſie to Repair, and the moſt neceſſary for Life, as the *Blood*, ceaſe at laſt to be ſufficiently Repair'd by the Defect of the others, which are not Repair'd at all. *Sanctorius*, being almoſt of the ſame Sentiment, holds, that *Natural Death* happens, becauſe the *Fibres* do ſo dry up, that they can no more be Renewed; he making the Maintenance of Life to depend from the Renovation of the Parts. Which doth not ſatisfie me neither, becauſe even the *Bones* themſelves, which are the hardeſt Parts, are capable of Renovation in *Old-Age*; in regard that *Old Oxen*, which we often eat, have at certain times (I ſay not of the *Moon*, according to the common Opinion) their *Bones* of the ſame place altogether Dry and *Marrow leſs*, and at other times bedew'd with a Subſtance of the Nature of *Marrow*, wherewith they are then fill'd, which enlargeth their Pores as of a fine Spunge and ſoftens them; which then eſpecially comes to paſs, after they have Fed upon good Paſture in the Spring.

We muſt therefore enquire into other more true Cauſes of *Old Age* and *Death*, which to me ſeem to be the following. I ſuppoſe, That the *Blood* is the *Principle* of *Life*, as far as 'tis *Vital*, that is, in Motion by the Hot Particles contain'd therein; ſo that thoſe who Expire by *Age*, do not Dye for being deſtitute of *Blood*, which is found abundant and laudable enough in their Veſſels, and which hath been ſufficiently Repaired till then; but becauſe it ceaſeth to be *Vital*, by reaſon of the too eaſie Diſſipation of the *Igneous* Particles, which make it ſuch: Which, in my Opinion, comes to paſs, as it doth in Wine, which Evaporates and looſeth its ſtrength by the fault of the Veſſel, which by ſome opening or other gives Paſſage to what gives Vertue to the Wine. The *Tunicles* and *Membranes* of the *Veines* and *Arteries* which encloſe the *Blood*, wear in time away and wax thin, and their Texture gives and breaks in ſeveral places, at which Apertures, the *Igneous* Particles abandon the *Blood*: As in Stuffs and Cloath (whoſe Wool is in a manner like that of the *Tunicles*) the Threads by wearing do looſen and break, in ſo much that many Holes are made in it as in a Sieve. So that if we had the Art to Reinforce and to Strengthen a new thoſe *Coats* and *Membranes*, that they might not let ſlip what maketh the *Blood Vital*, the *Life* would be Preſerved Perpetually. For a Proof of which this may ſerve for the preſent, that the *Life* of many Dying Perſons is maintained for ſome time, by making them ſwallow ſome Hot and Spirituous Liquor, as *Spirit* of *Wine*, or ſome *Eſſence*, by which the *Blood* is Fortifyed and Quickened

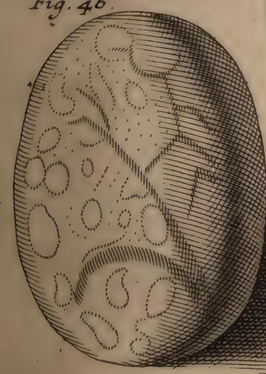
for

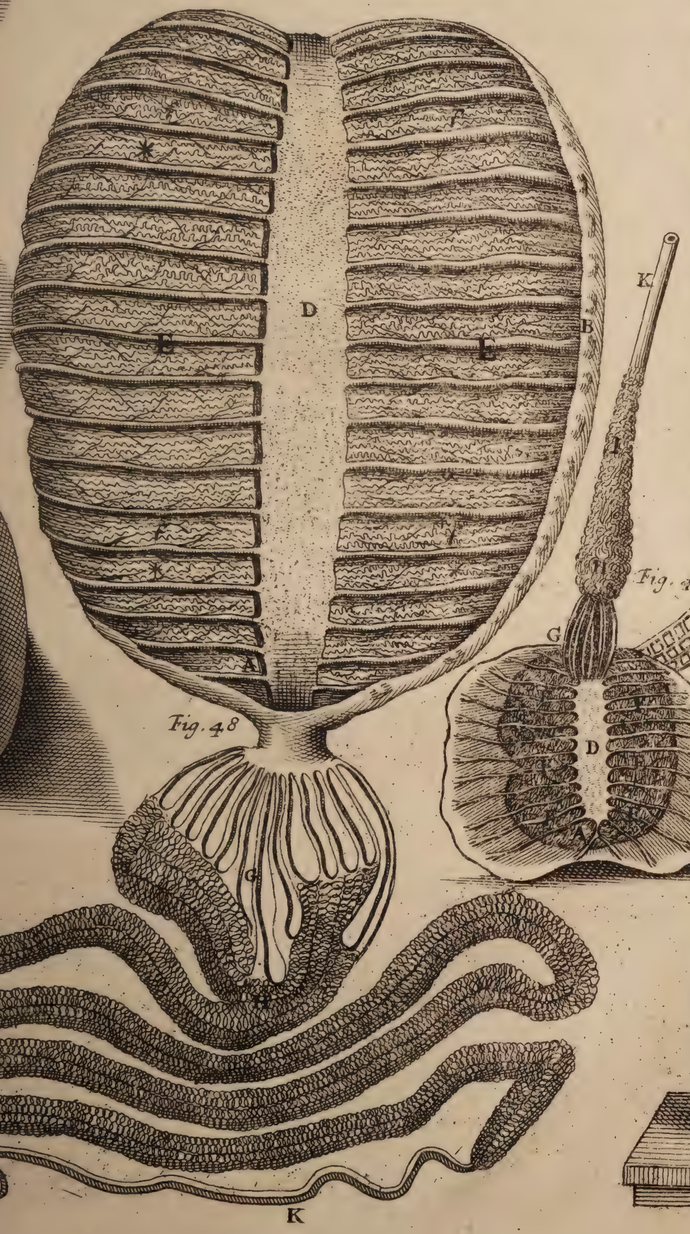
Plate 4. Vol. 3. Pag. 210.

Fig. 44.

Fig. 45.

Fig. 46.





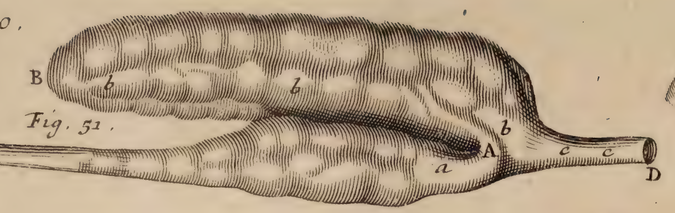
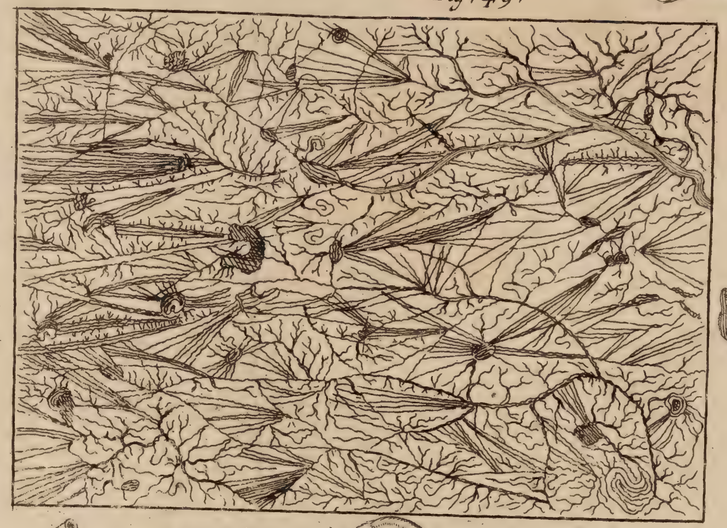


Fig. 51.

Fig. 53.

Fig. 49.



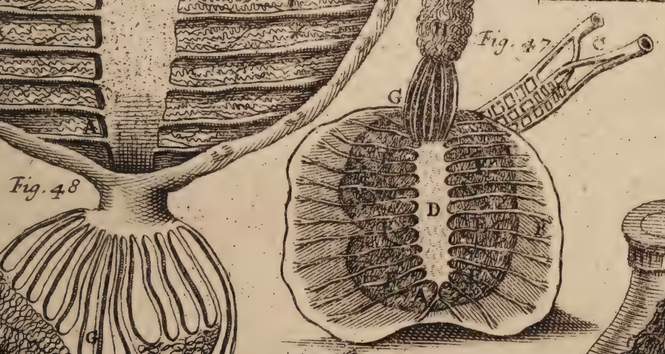


Fig. 47.

Fig. 50.

Fig. 54.

Fig. 59.

Fig. 52.

Fig. 57.

Fig. 55.

Fig. 58.

Fig. 56.

for ſome Moments: But as this Reinforcement of *Life*, convey'd to the *Heart*, and running into the *Veins*, ſoon ſlips out, ſo alſo this new Vigor paſſeth away quickly.

As there is no Reaſon to Deſpair of finding out ſuch Medicines, or Aliments, as are proper to Strengthen the *Coats* and *Membranes* of the *Veſſels*, ſo as that they may at all times retain the *Fiery* and *Spirituous* Corpuſcles of the *Blood*, as well as in the Time of *Youth*; We may alſo hope to be enabled to Maintain the *Blood* in a condition always to furniſh alike, as in our Vigorous Age, for all the Functions of Life: The Engine of our Body being not unlike to a *Chymiſt's Furnace*, which at firſt well Retaining the *Heat*, is very proper for the Operations of Art; but at laſt, Chinks and Crevices being made therein, it ceaſes to be ſo, the *Heat* getting away through them, what Fire ſoever you kindle therein.

The Motions of Diſeaſes, and the Births and Deaths of Animals in different Times of the Natural Day; by M. Paſchall. n. 202. p. 815.

VI. Having ſome Months ſince entertain'd a Suſpicion, that the Cauſes of *Tides* at *Sea* do alſo continually Exert their Power in other places, though the Effects thereof may not be ſo ſenſibly perceived on the Solid as the Fluid parts of this Terraqueous Globe; I took this Method to examine it. *Firſt*, I divided the Νυχθήμερον into four *Senaries* of Hours: The *Firſt* conſiſted of 3 Hours before the *Southing* of the *Moon* and 3 after; the *Second* of the 6 Hours following; and ſo the 3d, and 4th, contain'd the two remaining Quarters of the Natural Day. I next betook my ſelf to obſerve *Births* and *Deaths*, in our own Kind, as alſo of other Species of Animals, whether they fell out indifferently in any of theſe 4 *Senaries*: And I found none that were *Born* or *Dy'd* a Natural Death in the *Firſt* and 3*d Senaries*, which I take liberty to call *firſt* and *ſecond Tides*, but every one either in the *ſecond* or 4*th Senaries*, which I call *firſt* and 2*d Ebbs*. I then proceeded to make Obſervations in the *Motions* of *Diſeaſes*, which I could the better do, becauſe I had ſome in my Family Viſited with *Agues*: Here I found that the Tumult of the *Fits* generally laſted all the *Tiding Time*, and then went off in gentle kindly Sweats in the *Ebbs*. I went on then to take notice of the *Sex res non naturales*, and Alterations of the *Weather*, and ſuch Accounts as I could meet with of Earthquakes and ſundry other things: And I have yet met nothing to hinder me from laying down this as a Maxim, That *Motion*, *Vigour*, *Action*, *Strength*, &c. appear moſt and do beſt in the *Tiding Senaries*; and that *Reſt*, *Relaxation*, *Decay*, *Diſſolution* belong to the *Ebbing Senaries*.

Deaths *at no certain Hours of the* Tide; *by Mr.* Benj. Allen n. 231. p. 665.

VII. It is obſerved on our *Sea Coaſt*, with Relation to Mr. *Paſchall's* Obſervations, that People that are Sick change at the *Turns* of the *Tide* at the Place; ſo as this Notion has obtain'd among all the *Maritime* Towns: *Upland*, with us, it does not conſtantly hold; which may thus be accounted for, (if the *Moon's* Effect be *Fluidity*, as in Froſts is ſeen, a *New-Moon* ever Thawing, and is agreeable enough to a Neighbouring Body of ſo Quick a Motion) upon *Dry* Land the *Moon* may not have the ſame Force, for I obſerve in Capt. *James's* Voyage at *Charleton-Iſland*, the Fix'dneſs of the Winter

ter Frozen Air occasion'd the difference of *Tides* at the *New* and *Full* to be scarce greater than the common or *Neap* ones; whereas *Spring Tides* advanc't with the *Summer*. I have observ'd *Agues*, *Tertian* I mean, to come when the *Moon* has come to an Angle, as in One or Two exactly when the *Moon* was *Setting*, and the succeeding *Fits* when She *Culminated*, the Third *Fit* at a *Rising Moon*, and so on. *Deaths* I have kept exact Account of, but can find no one Observation hold true, some at one *Time* of the *Tide*, some at another.

VIII. *An Account of a Book*, Omitted.

n. 14. p. 254. King *Solomon*'s Pourtraiture of *Old Age*; by *Jo. Smith.* M. D.

CHAP. IX.

Pharmacy. Chymistry.

Three Queries relating to the Entalia, Dentalia, Blatta Byzantina, Purpura *and* Buccina *of the* Shops; *by Mr.* Sam. Dale. *n.* 197. *p.* 641.

Answer'd; *by Dr.* Lister. *Ib.*

1. WHat is the *Entalia* of the *Shops*? By what Authors Described? under what Names? and how they differ from the *Dentalia*?

2. Of what *Shell* is the *Blatta Byzantina* the *Operculum*?

3. There are divers sorts of *Purpuræ* among Authors, which is that of the *Shops*? Likewise which sort of *Buccina* and *Umbilici Marini* ought to be used in *Shops*?

2. 1. As to the *Entalia*, I do not remember to have seen any thing in the *Shops* under that Name. The Descriptions of the *Dentalia* in *Schroder* are very faulty, and both those and the *Entalia* by him should seem to be the 2 Species of *Dentalia*, which are by me figured. The *Dentalium* being that which is commonly and in plenty found about the Island of *Garnsey*, and elsewhere upon our Coast; and is the same with that found in the *Mediteranean*. It is a Long, Slender, Round Pipe, a little bending and tapering, hollow and open at both ends, without any Crack or Flaw, naturally, White at one end, and usually a little Reddish; very Smooth and Polished on the outside, and from thence and the Figure called a *Dog-like Tooth*. The *Entalium*, or other Species of the *Dentalia*, is very much longer and thicker than the former, much like in other respects, save that this is Streak'd with high ridges, and mostly of a Greenish Colour. This Species I guess to come from the *Indies*. *Note*, that any thing that is wrought into, or channelled, is in the Modern *Italian* call'd an *Intaglia*; whence I believe, and the nearness of the Word *Dentalia*, arose those distinctions of Names.

2. To the *Second Query*; I take the *Blatta Byzantina* to have succeeded the *Unguis Odoratus*, and to have been brought into the *Shops* in its place. In *Dioscorides*'s Time the Best was brought from the *Red-Sea*, *viz.* the Palest and Fattest; the Blacker, and Less, from *Babylon* or the *Persian Gulf*; but

but it seems later times took up with those found about *Constantinople*; whence the present *Shop Blatta*, had its Name. The Name of *Blatta* is given to this *Operculum*, from the Colour I gues; as being of a Dark Hair Colour, as the common *Blatta Pistinaria*, so common in *London*, is; also this being a Broad, Thin, Flat Beetle like the Cover.

'Tis true, the same *Dioscorides* says, the *Unguis* was an *Operculum* (πῶμα κογχυλίου) like to that of the *Purple-Fish*; He means what was used in his time; in which it seems the *Unguis Odoratus* was lost, or was not brought to *Europe*. But it will appear out of the same *Dioscorides*, that the *Unguis* was no *Operculum*. It will be worth the while to make out this Mistake, and consequently the Error the *Moderns* have been in to substitute an *Operculum* of a *Marine Turben* for the true *Unguis Odoratus*.

Take the History of the *Unguis* out of *Dioscorides*. " It is found, says he, " in the Lakes of *India* where *Narde* grows, wherefore the *Conchylia* feed- " ing on *Narde* are *Aromatick*. It is gathered after that the Lakes are dry'd " up with Summer Heats. He concludes, the *Conchylium* it self Burn'd or " Calcin'd, is of the same Efficacy with the *Purpura* and *Buccinum* burnt. In the Chapter of *Narde*, He says farther, That the *Indian Narde* grew near the River *Ganges*, that is, in certain Lakes, which the overflowing of that River caused. Hence it appears (1.) That the *Unguis Odoratus* was part of a *Fresh-water Conchylium*, (2.) Now if it was gathered in the *Nardiferous* Lakes upon the River *Ganges*, how comes it to pass that the same was brought out of the *Red Sea* and *Babylon*. And why should the Shell it self be brought, an useless Luggage, so far, as from the River *Ganges* to *Greece*, the *Operculum* rarely being a Tenth part of the Shell it self. Now if it was not used to be brought and expos'd to Sale, to what purpose was it to declare its *Vertues*, or how could the Experiment be made? I conjecture therefore, that the true *Unguis Odoratus* was something like the half of a *Pectunculus Fluviatilis*, so common in the River *Thames*, of the bigness and thickness of my Thumb-nail, and that for these Reasons;

1. That the *Unguis Odoratus* seems to have been a *Fresh-Water Bivalve* or *Muscle*, for that they stayed till the Lakes on the River *Ganges* were dried up before they gathered them. Now *Bivalves* are ever buried in Sand and Mud, and never Rise up and Swim about and Float as the *Turbinate Snails* do, to which latter only the *Operculum* belongs, and which therefore were always, and easily to be caught.

2. He calls this Snail *Conchylium*, and by that general Name distinguishes it from all the other sorts, concerning which he treats in several Chapters; which though in general it take in both kinds, as well *Turbinate* as *Bivalve*; yet it does more particularly denote a *Concha* or *Bivalve*.

3. The *Onyx* is expressly reckoned by *Pliny* amongst the *Bivalves*. For (*l.* 32. *c.* 11.) he makes all these Synonimous, *Solen*, sive *Aulos*, sive *Donax*, sive *Onyx*, sive *Dactylus*. And again more particularly, (*Lib.* 9. *c.* 61. He says, *Ex* Concharum *genere sunt* Dactyli, *ab* Humanorum Unguium *similitudine appellati*. So that in all probability the *Onyx Odoratus* brought more anciently out of the *Fresh-water Lakes* about *Ganges* in *India*, was not un-

like the common *Onyx* of the *Mediterranean*, which was of the *Solen* kind.

Whatever the *Blatta Byzantia* of our *Shops* is, which has certainly nothing of the Characters of the Ancient *Aromatick Unguis*, and which in all probability was loſt upon the account of the difficult paſſage from *Ganges* into *Europe*, I lament its loſs, which I have reaſon to believe was a good Medicine, from its ſtrong *Aromatick* Smell; which is much wanting in our *Teſtaceous Powders*, of which this was one of the Number, ſo much uſed, and that not without good reaſon now-a-days, which are all very Flat and Inſipid.

To the *Third*, The *Purpura* of the *Ancients* is well made out, and Figured by *Fabius Columna*: And it is one of the moſt common *Murices* of the *Mediterranean Sea*. In this he could not be much miſtaken, becauſe as I remember, he ſomewhere mentions heaps of thoſe Shells where *Officinæ Purpuræ* anciently were; and alſo from the *Purple* Sanies the Fiſh yields of it ſelf. He mentions one or two more Species of *Turbinate Snails*, to be found in the *Mediterranean*, which yield a *Purple* Juice. Upon the whole Matter it is Indifferent, what ſort of *Shell* we uſe in the *Shops*, if it be to be *Calcined*, provided it be a *Sea-Shell*. Nor do I find either *Dioſcorides* or *Ætius* to have Diſtinguiſhed betwixt the *Oſtrea Purpura* or *Buccinum* Calcined; but gives them all the ſame *Cauſtick* Virtue; poſſibly ſome one Species may have it in a Higher Degree, as we ſee the various ſorts of *Limeſtone*, if Calcined, differ in ſtrength.

One thing I ſhall not omit before I end this Paper, becauſe it is now in my Mind, that tho' the Species of *Shell* or *Purpura* be ſcarce known to our *Shops* at this day, yet the uſe of the *Purple* Juice has been, by Tradition at leaſt, Tranſmitted down to our Times, and kept as a Secret even in theſe Iſlands till Mr. *Cole* got hold of it, and Publiſh'd it. Sir *Rob. Southwell* told me many Years ago, that his own Mother in *Ireland* was famous for Marking Handkerchiefs with the Juice of *Fiſh*; which Mark would never waſh out. And the very Learn'd Mr. *Jo. Beaumont* informs me of a Paſſage in our *Beda*'s *Eccleſiaſtical Hiſtory* relating to the *Purple*, as a known thing in his Time. The Paſſage is as follows;

Vid. Vol. I. *Cap.* VI. Sect.

Bedæ *Hiſt. Eccleſ.* l. 1. c. 1.

Variis Conchyliorum *generibus exceptis: in quibus ſunt &* Muſculæ, *quibus incluſam Sæpe* Margaritam *omnis quidem Coloris optimam inveniunt; id eſt, & Rubicundi & Purpurei, & Hyacinthi & Praſici ſed maxime Candidi. Sunt &* Cochleæ *Satis ſuperque abundantes, quibus* Tinctura Coccinei *Coloris conficitur. Cujus Rubor Pulcherrimus nullo utiquam Solis ardore, nulla valet Pluviarum Injuria palleſcere; ſed quo* vetuſtior, *eo ſolet eſſe* venuſtior.

You ſee from this Paſſage the *Purple* Trade of *Dying* was uſed in *England* and very much valued.

Fig. 81. Repreſents the true *Purpura* of the *Ancients*, by the *Italians* called *Geruſolo*.

Fig. 81.

Stones *in ſeveral Animals*; *by Mr.* Wil. Clerk. n. 250. p. 99.

II. *Stones* are not only found in *Humane Bodies*, but alſo in ſeveral Parts of other Animals, as *Bezoar Stone* found in the Stomach of a kind of *Goat* in both *Indies*; as alſo in the Stomach of *Monkeys* (which is eſteemed the beſt)

beſt). There is alſo a kind of *Bezoar* called *Cow-Bezoar*, found in the Stomach of a *Cow*. *Hippalithus* found in the Stomach of *Horſes*; *Ægagropila*, in the *Capra Alpina*, &c.

The Writers of the *Materia Medica* aſcribed great *Vertues* to theſe *Stones* and particularly the *Bezoar*, and have wrote large Encomiums upon them. But if *Phyſicians* would conſider ſeriouſly the true Worth of them, they would find, that their *Vertue* proceeds more from their being brought from a *Forreign* Country, and a common Vogue and Eſteem they have got in the World, than from any *Intrinſick Vertue* they have in the *Cures* of Diſeaſes; and that which ſeems moſt to Recommend them is their *Extravagant Price.*

Much eſteem'd by many Writers, but in truth of little purpoſe in Phyſick.

III. That ſome *Diſtillations* may be made by *Froſts*, I have this Proof: At my requeſt you were pleaſed to get me a *Thermometer* of a very ſmall and Slender Stem, eſpecially the higher parts for 10 Inches near the Head. The *Spirit* of *Wine* is very deeply Ting'd, which renders it in that ſmallneſs clearly viſible? I expoſed it out of Doors in the *Hardeſt Froſts* of the extream Winter *An.* 1665. when the Winds were alſo violently Sharp. In thoſe *Froſts* there Aſcended to the Top of the Glaſs ſmall *Drops* like a *Dew*, which afterward in time Deſcended into the Stem, and filled up the Space of an Inch or thereabouts, and it was as Clear, and Bright, and more Flickering, than any Cryſtal, or Glaſs. On the contrary, in the *Heat* of the *Summer*, I placed a ſtronger *Thermometer* of Slow motion on a Sunny Wall, till a part of the Liquor Aſcended into the Top, and there continued ſome Hours: Then by ſloping the Glaſs I divided it from the reſt at a little diſtance: And this took up two Inches in the Stem, being at firſt of a very Pale Reddiſhneſs. I gueſs it contained much of the *Spirit* of *Urine*, *which at firſt was intermingled with the Spirit of Wine*; but in a ſhort time all the Reddiſhneſs was quite Conſumed: And Since it remains of a Tranſparent, but very dull Clearneſs, in no degree ſo bright, and Flickering, as the other.

Cold Diſtillations; *by Dr.* Jo. Beale. n. 56. p. 1140.

Whether this may prove a *Diſtillation* of the ſame kind, and not differing from *Diſtillations* by *Heat*, I know not: But we are ſure, that *Falſe* Grounds and *Vain* Hopes have done Infinite good to us, and to our Poſterity, by *Pyrotechne*; And why may not we accept of *Specious* hopes to attempt ſomething in *Pſychrotchne.*

IV. After this Learn'd and Experienc'd *Phyſician* and *Chymiſt* had often with himſelf conſider'd, what the Reaſon might be, Why the chief *Chymical Operations* had been hitherto Contemned, and by ſome reputed even for Chimera's; He affirms to have found at laſt, that the true Cauſe thereof is, that the *Artiſts* have not made uſe, as they ſhould, of thoſe Means and Ways, that would have made them Succeſsfull. Now of thoſe Means he aſſureth, by his own Experience, theſe three to be the moſt Eminent and the moſt Admirable for uſe, *viz. Digeſtion*, *Fermentation*, and *Triture*; Operations ſufficiently diſcourſed of, but, in his Opinion, little underſtood as to

The great Uſe of Digeſtion, Fermentation, *and* Triture; *by Dr.* Joel Langelot. n. 87. p. 5052.

their Efficacy and Uſefulneſs, which he here undertaketh to make out by ſome conſiderable and uncommon Experiments.

Firſt then, he ſhews the excellent uſefulneſs of *Digeſtion* in the Preparation of the *Volatile Salt* of *Tartar*. Where having mention'd the difficulties and unſucceſsfulneſs in other Proceſſes, tryed by him, he aſſures us, That as ſoon as he made uſe of a long *Digeſtion* he ſucceeded ſo well, that the very firſt time he Obtained, what he fear'd he ſhould not have gotten by many *Cohobations*, which was a pure white *Volatile Salt* of *Tartar*, leaving behind a few quite inſipid *Fæces* of an Earthen Colour.

To this he Adds another great uſe of *Digeſtions*, in duly preparing the *Eſſences* of *Mineral Sulphurs*; inſtancing an Experiment made upon *Corals*, as moſt clearly of all repreſenting that great Power of *Digeſtions*. He poured then, ſome Years agoe, upon Fragments of *Red-Coral* an *Oyl*, which among all Diſtilled Vegetables is, as far as he knows, the Mildeſt; deſirous to try whether he could extract a *Tincture* therewith. But finding after a long time no change at all in the *Coral* nor *Oyl*, he laid by all Thoughts of it. But having one Winter other things to *Digeſt* in a *Digeſting Furnace*, he thought good to reſume that *Coralline* Operation, and to give the *Bolt-head*, wherein that Matter was yet contained, a place there, not without good Succeſs. For within a Month's time, when he ſtirr'd it as he uſed to do, he perceived, that the bits of *Coral* had a Higher Colour, and were grown Softer, yet without any change in the *Oyl*. He therefore continued the ſame Degree of Heat, and after ſome days ſaw, to his wonder, That the *Corals* were altogether *Diſſolved* into a very Red *Mucilage*, yet the *Oil* ſtill ſwimming upon them in the Priſtine Form, without having received any Tincture at all. He did ſhake the Veſſel vehemently and often, to ſee whether he could Unite the *Oil* with the *Mucilage* of the *Corals*; but all was in vain, the *Oil* ſtill Aſcending when the Veſſel was at reſt, and the *Mucilage* Subſiding. Whereupon he tried whether he could Combine them by *Digeſtion*; but that alſo not ſucceeding, he poured off the *Oyl* (which he found to retain almoſt its former Scent and Taſte) and poured upon the remaining *Mucilage* ſome *Tartariz'd Spirit* of *Wine*, of which by a ſhort *Digeſtion* it was reſolved into a highly *Red Tincture*.

By theſe two Experiments, the Author thinks, he hath made it Evident, of what Value the hitherto neglected Works of *Digeſtion* are; as alſo given a Hint of the great Efficacy there is in *Volatile Salts*, if they be Fetter'd, and kept from Avolation.

Secondly, to ſhew the Power aud Uſe of *Fermentation* in *Chymiſtry*, he inſtances firſt in a True *Volatilization* of *Salt* of *Tartar* by means of the ſame; paſſing by what he hath performed thereby, upon *Antimony*, *Pearls*, *Coral*, &c. He ſaith then, that to obtain the *Spirit* of the *Volatile Salt* of *Tartar*, he proceeded thus; He took of *Crude Tartar*, 2, 3 or more *Pounds* (according to pleaſure) and firſt *Calcin'd* it ſlightly and only to ſome Blackneſs, to have what is moſt neceſſary, a *Ferment* to *ferment* the *Tartar* with. Having put this into a large Pot, he poured on it ſo much Water, that it ſtood an Inch high above it. 1. Then he gave it at firſt a *Gentle*

Gentle Fire to make it Lukewarm; which done, he poured into it *half a handful* of finely *Pulveriz'd Tartar*, and shortly after saw some Bubbles arise, that Increased more and more. Which perceiving, he continued, as he had begun, at several times to pour in more *Powder* of *Tartar*, whereby the *Fermentation* was Rais'd and Quicken'd, the Bubbles thereupon Rising in so regular an Order, as if they had been natural Grapes; the Colour excepted. But here he was to keep a very exact *Regiment* of the *Fire*, such as all *Fermentation* requireth; and took care also, least by a too copious Affusion of the said Powder, the *Ebullition* should grow too Vehement, and the Pot run over. The *Fermentation* ceasing, he put all that was in the Pot into an *Iron Bolt-head* (a *Glass* one being in danger to be broken,) to which he often apply'd a wet Linnen Cloth, thereby to hinder a too great Boiling up of the *Fermented Tartar*, which else will suddenly Run up and pass into the *Recipient* it self. Wherefore the *Fire* is also very carefully to be Govern'd, and Increas'd by little and little; though at last it must be Strong, to force up all the *Salt*. Which being observ'd by him, he found the Gross and Feculent *Tartar* by the said *Fermentation* so *Volatiliz'd*, that there remain'd not any *Fixt Salt* in the *Caput Mortuum*; Which, he saith, he hath experienc'd more than once. He adds, that the Liquor obtain'd from thence, having much Water in it, Added for the sake of the *Fermentation*, is also to be much *Rectify'd*, and that so far till it appear Whitish; which shews that it holds a due quantity of *Volatile Salt*. Which *Salt*, of what Value it is, this Author would have us to Estimate from the Testimony of *Van Helmont*, *c.* 15. *de Feb. p. m.* 780. and from the wonderful *Vertue* himself saith to have found in it, both in *Internal* and *External Affections* of the Body, and even in *Gangrenes* themselves; besides, that by means thereof he hath prepared some *Essences*, which in vain he had try'd to make by other *Menstruums*.

Another Instance he gives us of the great Use of *Fermentation* in Separating *Impure* and *Noxious Sulphurs*: which he prescribeth to try in *Opium*, whereby, according to him, it becomes not only a very *safe Medicine*, but also a Highly Useful one for very many Cases, if rightly used.

Take then, saith he, of true *Theban Opium*, sliced, 1 *Pound*; and pour upon it in a low Cucurbite 10 *Pounds* of Fresh *Juice* of *Quinces* very Ripe, adding to it 1 *Ounce* of Pure and very Dry *Salt* of *Tartar*; expose it to a gentle Heat for a Day or two, until there appear some *Bubbles*, which is a sign of the *Fermentation* at Hand. Then, to further the same, Add 4 *Ounces* of *Sugar* very finely Pulveriz'd, and observe still such a degree of Heat, as the *Fermentation* requireth; which by so doing will duly proceed, and you shall see the *Opium* manifestly Rise and Dissolve *per minima*; taking heed mean while of the Strong-scented *Stupifying Sulphur*, which then is wont to Steam out. You'll then also see a part of the Impure Volatile Scum to Emerge at the Top, and the more Terrestrial to Subside at the Bottom of the Vessel; the purer part staying in the middle, which is a Red Liquor, like a *Ruby* Transparent; which you are with Care to *Separate*, *Filtrate*, and by a due *Distillation* to Thicken to the *Consistence* of *Honey*. And this you must again Dissolve by an Highly *Rectify'd Spirit* of *Wine*, *Filtring* it, and

Digest-

Digeſting it for a *Month*, that whatſoever of Crude there may yet be in it, may be by that Celeſtial Fire Ripen'd and brought to Perfection. This *Spirit* being abſtracted to a due Conſiſtency, you will find this *Eſſence* to be of that Vertue, that the *4th part* of a *Grain*, or at moſt *half* a *Grain*, taken in a proper Vehicle, Moiſt or Dry, will perform very Wonderful things.

3. Having diſpatch't *Digeſtion* and *Fermentation*, he comes now to *Trituration*; by which alone he eſteems many great and admirable things may be perform'd in *Chymiſtry*. To which he is perſwaded he ſhall very eaſily obtain the Aſſent of all thoſe, that ſhall but obſerve and well conſider the two following *Operations*, both experimented in the *Laboratory* of *Gottorp*, in the preſence of the late Duke *Frederick*, a Prince exceedingly well vers'd in all kind of Knowledge, eſpecially that of *Chymiſtry*.

The *firſt Operation* was made upon *Gold*; which, though the moſt *Fix'd* of all Bodies we know, was, though it will not yield to *Fire*, nor to any other known Diſſolvent, Maſter'd by *Grinding*; which he aſſureth himſelf to have been an Eye-witneſs of. But this he did by means of a ſingular Inſtrument, by him call'd a *Philoſophical Mill*, whoſe Structure is thus deſcrib'd.

Fig. 82.

A, A *Leaden Head* pretty thick.

B, The *Axis*.

C, An *Indented* Drum.

D, A *Drum* conſiſting of *Coggs*.

E, A *Mortar*.

F, *Peſtles*.

G, A *Handle*, by which the *Mill* is Turn'd.

a, The Superior part of the *Axis*, which is Round.

b, The Inferior part of the ſame, which is *Square*.

c, *d*, Here both the *Peſtles* are affix'd to the *Axis*.

e, Here the *Peſtles* are *ſtrengthned* by a ſtrong Braſs Ring.

f f, Here both *Peſtles* are *ſtrengthned* by two Braſs-caſes.

g g, Both the thick *Peſtles* of *Glaſs*.

The *Operation* it ſelf follows.

Put *Leaf-Gold*, as much as you pleaſe, cut very ſmall, into a very thick *Glaſs-Mortar*, or into one of *Gold* (ſuch an one as the late *King* of *Denmark*, a little before his Death, cauſed to be made for this *Operation*:) In this *Mortar*, cover'd only with Paper leſt any Duſt or other thing ſhould fall in, *Grind* the ſaid *Gold* Night and Day by an uninterrupted Agitation of the Mill, till you ſee it reduc'd into a Duskiſh Colour. For which *Grinding* there are commonly to be allowed 14 *Days* and *Nights*. But if you will only Work by Day, there will need a whole *Month*. This done, put the *Powder* into a *Retort*, not very deep but Shallow, ſuch as the *Engliſh* ones uſe to be; and *drive* it by a *Fire* of *Sand* by degrees, but at laſt by a very *Strong* one; and there will come over a few but very *Red Drops*, which being *Digeſted* either *per ſe*, or with *Tartariſed Spirit* of *Wine*, give you a true *Aurum Potabile*, which is Sincere, and unimbued with any Forreign Quality.

The

The Remainder though they could alſo have eaſily *Reſolved* by *Grinding*; yet they thought good to make an *Extract* of it by means of their *Philoſophical Acetum*, made of *Verdigreaſe*, *Sulphur*, and a *Highly Rectify'd Spirit* of *Wine*, by a long *Digeſtion*: Whereby they got again a *Tincture* ſufficiently *Red* and of very great Vertue. And that little that remain'd, which was but very little, they reduced into a *Body* by the means of *Borax*; but it wanted its due *Weight*.

'Tis true, ſaith our Author, that at the firſt View this *Operation* ſeems to be groſs, requiring much Time and Labour, but little *Art*; but well conſider'd, 'tis highly Admirable, being Aſſiſted by the wonderful *Salt* of the *Air*, as the only *Catholick Diſſolvent*. And that *Salt* is by the continual *Grinding* Attracted and Intermixt, many other *Experiments*, made by him about it, have taught him; which he reſerves for the Publication, hereafter to be made, of the things done in the *Gottorpian Laboratory*.

The 2*d Experiment* of the uſe of this *Grinding*, was in a True and Genuine Preparation of the *Mercury* of *Antimony*: A *Proceſs* affirm'd not only made by himſelf before his *Prince*, but alſo by the Hands of that very Experienc'd *Chymiſt* of the *Elector* of *Saxony*, *Johannes Kunchelius*.

The *Operation* conſiſts in this; *Grind* firſt the *Regulus* of *Antimony* into an Impalpable Powder; and to 1 *Pound* of it add 2 *Pounds* of very pure and dry *Salt* of *Tartar*, and 8 *Ounces* of *Sal Armoniack*; and mix it well together. Then moiſten it with ſome *Urine* of an Healthy Man, eſpecially of one that drinks Wine, if ſuch may be had; and take care, to have this Mixture *Ground* for a whole *Day* together without any Intermiſſion by two very ſtrong young Men; always, if there want Moiſture, ſprinkling *Urine* upon it, that it may ſtand 3 Inches high over it, and Cloſing it well, keep it in *Digeſtion* for a whole *Month*, daily ſhaking it. And if during that time the Maſs appear to be Dry, pour on more *Urine*. The *Digeſtion* being ended, form the matter into *Globules* with equal parts of *beaten Glaſs* and *Calx vive*, and Dry it in the *Shade*. Of theſe, *Extract* the *Mercury* in manner following;

Let there be ready an oblong Iron Veſſel, like a *Bolt Head*, into which pour Cold Water, and dig it into the Ground: Upon it put an Iron Plate with many Holes in it, and lay thereon the ſaid *Globules* well dry'd; then fit alſo an *Iron Head*, ſomewhat Flatted, to it, that you may conveniently lay Coals thereon, and thus keep a Moderate *Fire* for 4 *Hours*, then increaſe the *Fire* for as many *Hours*, unto the laſt. After that, let it Cool, and beware, not to ſtir the Veſſel digg'd in the Ground, nor to pour out the Water, before that be altogether Cool'd; or elſe you will looſe a great deal of the *Mercury*; as happen'd, it ſeems, to our Author, when his *Prince*, being impatient of delay, commanded the Water to be pour'd out before it was Time: For the *Mercury*, being by ſo *Strong* a *Fire* reſolv'd into Atoms, is to be *Coagulated* again by *Cold*.

This *Mercury* of *Antimony* our Author Glorieth in, as having Prepared and handled it with his own Hands, and ſeen it with his own Eyes, after the finiſht *Diſtillation*, running in the bottom of the Veſſel. Neither doth he care if

any

any do call it a *Non-Entity*, or if any Unwary Laborants be Unſucceſsful in the *Operation*. It is ſufficient to him, that he hath alledged nothing but what he hath tryed himſelf, and candidly deſcribed. He wiſheth ſuch *Operators* to conſider, how many things there are to be obſerved before and in the *Operation*, and even after it, if you will be certain thereof. Which, he ſaith, may plainly appear even by the *Operation* of the *Tartar* alone; for as much as all *Tartar* is not equally good, and himſelf hath met with great Diverſity of the ſame: Beſides which, great care is to be had of the *Fermentation* it ſelf of the *Tartar*; for if it be not duly made, the *Tartar* will not be Reſolved *per minima*; nor will the Grapes be repreſented in that natural Shape they ought to be; nor will all the *Salt*, (which is the main thing) be *Volatiliz'd*. Further, if perhaps the *Fire* be exceſſive, during the *Diſtillation*, much of the *Volatile Salt* will be burnt up, and it will yield a ſtrong-Smelling *Spirit*.

Having diſpatcht this, the Author ſubjoyns an accompt he met with among his Papers, of another way of *Operation* of *Grinding* of *Gold*; which though he have not yet tryed, yet it ſeeming to him very likely to ſucceed, He ſcruples not to communicate alſo. The Inſtruments to be uſed therein, he deſcribes thus.

Fig. 83.

a. A *Mortar* of very fine *Steel.*

b. A *Body* ſerving for a *Peſtle*, of the ſame *Metal*, which is to fit the *Mortar*; as 'tis delineated in the *Figure.*

c. Is a ſmall ſpace, where is Interpoſed a *Golden Plate*, half a Ducat Thick.

d. The *handle*, by which the *Peſtle* is to be managed in the work of *Grinding*, which is to be continued for 3 *Weeks*; at the end of which the *Gold* will be reſolved into a *Potable Liquor.*

This way, as it is much ſimpler, ſo 'tis by the Author eſteemed much more expedient than the former, by reaſon of the *Sulphury Saline* Quality of *Iron*, which by *Grinding* being open'd and highly Subtiliz'd, acts the more powfully upon the moſt Solid Body of *Gold*, and Attracts withal the *Salt* that is in the *Air* in greater plenty, than can be done in a *Glaſs* or *Golden Mortar.* And if it be objected, that by that long continued *Grinding* the Steely particles are worn off, and commixt with thoſe of the *Gold*; the Author would have it conſidered, how great a *Cognation* there is between thoſe *Sulphurs*, and alſo how great is the Uſe of *Digeſtion*, ſeparating the Pure from the Impure, and withal exciting that Occult *Fire* of *Mars*, well known to the True Searchers of Nature; which being aſſiſted by the *Alcool* of *Wine*, is able to *Concoct* the little *Immature* portion to a due *Maturity.*

The Volatiliz t-on *of* Salt *of* Tartar *Elucidated*; *by Dr.* Dav. von der Becke. n. 92. p. 5185.

V. This Author having (as he affirms, and as will appear by the Sequel,) formerly taken pains in the *Fermentation* of *Tartar* for the *Volatilizing* the *Fixt Salt* thereof, he endeavours here to declare his thoughts about the Cauſes of his undertaking that Labour, and of the Manner how that *Volatilization* is performed. In the doing of which he labours to ſhew, *firſt*, The Cauſes of the *Fixation* of the *Salt* of *Tartar*; *Secondly*, The Reaſons of the

Vola-

Fig. 60.

Fig. 61.

Fig. 62.

Fig. 63.

Fig. 64.

Fig. 65.

Fig. 66.

Fig. 67.

Fig. 68.

Fig. 69.

Fig. 70.

Fig. 71.

Fig. 72.

Fig. 73.

Fig. 74.

Fig. 75.

Fig. 76.

Fig. 77.

Fig. 78.

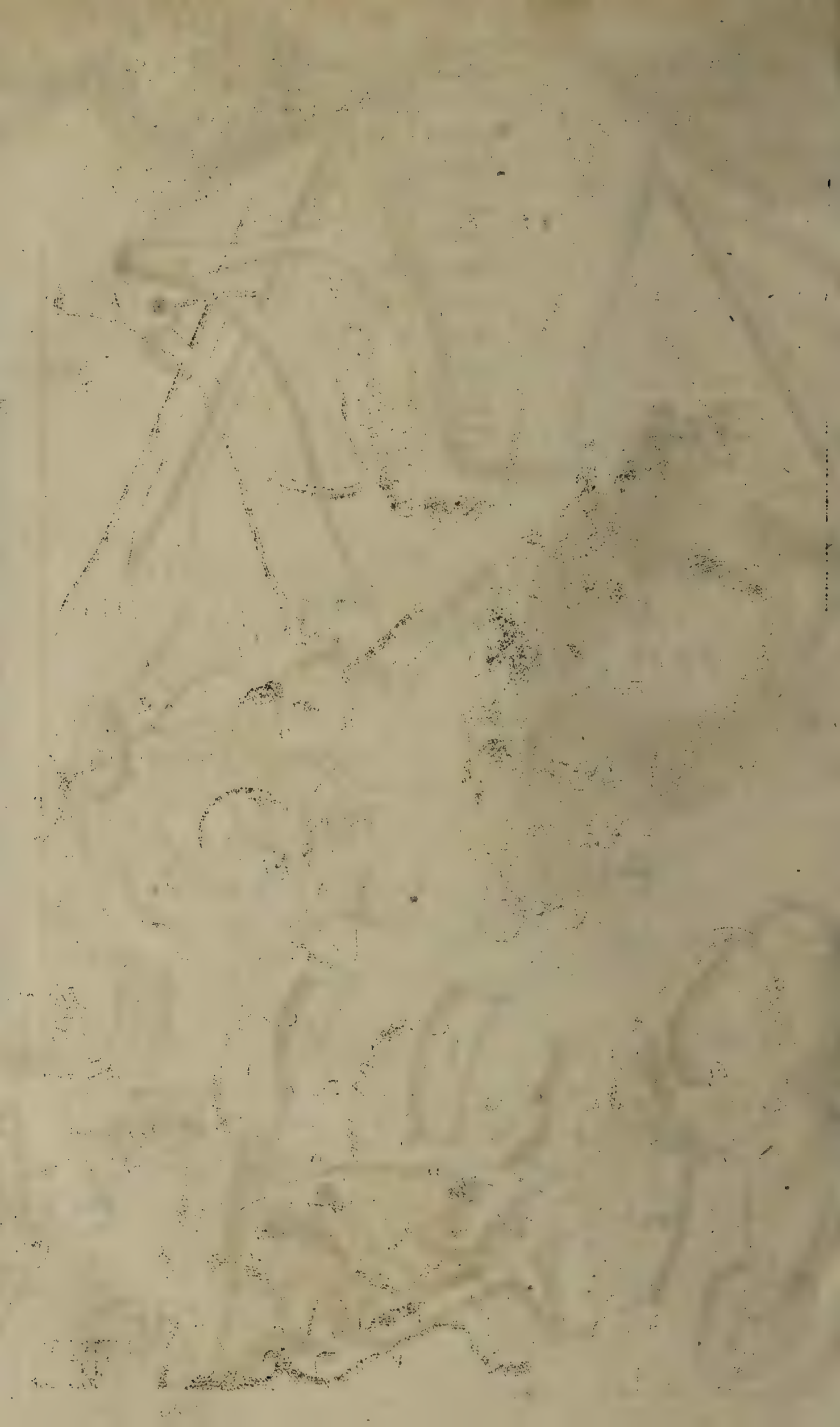
Fig. 79.

Fig. 80.

Fig. 81.

Fig. 82.

Fig. 83.



Volatilization; And *laſtly*, what degree of *Volatility* the *Salt* of *Tartar* hath acquired in that *Fermentation* made with its own *Ferment*.

As to the *firſt*, he begins with blaming thoſe, that divide *Salts* into *Fixt* and *Volatile*, foraſmuch as, in his Opinion, that Diviſion is unknown to Nature, there being not to be formally found in any Body before *Calcination* any *Fixt Salt*, ſuch as the *Alcalizate Salt* of *Tartar* and other *Fixt Salts* are, produced by *Calcination*. He therefore informs us, That *Salts* that are *Volatile* before *Incineration*, are by the Action of the *Fire*, as the Efficient, ſo Colliquated among themſelves and with the Earthy particles, as to be *fixed* thereby. For the clearing of which he preſuppoſeth, with ſome others, that there are two kinds of *Salts*, an *Alcali* and an *Acid*, as the genuin Inſtruments of Nature, by which the ſeveral kinds and ſeeds of things are put forth, and which every where are imployed in the *Germination* of *Plants*, and the firſt *Conceptions* of *Animals*, and in all the *beginnings* of *Fermentations*. Theſe two *Salts* he affirms to be both *Volatile*, and therefore eaſily reſoluble by the Supervening *Salt* of the *Air*: ſince it appears, that all *Vegetables*, eſpecially *Aromaticks*, if they be any conſiderable time expoſed to the *Air*, looſe their *Salts*; and that Wood in particular, by the Action of the *Air*, conſuming the *Volatile Salt*, doth in time quite moulder away. Whilſt therefore theſe *Salts* are looſened and ſet at liberty by the *Fire*, (for elſe they would not Act,) they begin to Operate on one another; the *Volatile Acid*, whilſt it works upon the *Volatile Alcali*, fixeth it, and they are colliquated together. Which Operation of Nature being well obſerved, it will be manifeſt that that received Axiom, *Things Volatile are fixed by thoſe that are Fixt, and things fixt rendred Volatile by thoſe that are Volatile*, is falſe. Now, that *Volatile Salts* are conſumed by the *Air*, and *colliquated* by *Fire*, is ſo notorious, that Common People are wont to Sink in Water, ſuch Timber as they would preſerve from *Putrefaction*, thereby to keep it from *Air*, and to harden it to a great degree for ſtrong ſupports of Buildings. Hence alſo they ſlightly Burn the ends of Timber to be ſet in the Ground, that ſo by the *Fuſion* made by *Fire* the *Volatile Salts*, which by the Acceſſion of the Moiſture of the Earth would eaſily be conſumed to the Corruption of the Timber, may catch and *Fix* one another. For which reaſon alſo, namely the *Fuſion* of the ſame *Volatile Salts*, Ship-wrights are wont to Burn the lowermoſt part of Ships, that lyes under Water. And to uſe a very common Inſtance, *Soot*; 'tis known, that whilſt the Wood is burning, the *Smoak* aſcends, wherein the two *Volatile Salts* are contained, that *Coagulate* one another into *Soot*, which 2 *Salts* may thence eaſily be ſeparated and made viſible; and theſe *Volatile Salts*, conſtituting the *Smoak* and the *Soot*, riſe ſo long, untill the Wood be quite reduced to *Aſhes*, in which the remaining *Volatile Salts* are *Colliquated* to a *Fixt Salt*, eaſily to be waſht out by Water. Theſe two *Volatile Salts* therefore afford the matter, of which the *Fixt Salt* is made by means of the Fire: Whence 'tis evident, that we muſt, (as really we do,) obtain ſo much the more *Fixt Salt*, the more *Volatile Salt* there was before *Incineration* in the Mixt Body; as alſo, why out of *Herbs* freſhly burnt to

Aſhes, we get a greater quantity of *Fixt Salt*, than when they have been Dry'd up; becauſe the *Air* by its Operation (which is ſomewhat advanced by the Moiſture in the Plant it ſelf diſſolving the *Salts*,) hath robbed them of the greateſt part of their *Volatile Salts*. Upon which ſame Account, Wood, Decayed and Mouldered away, contains almoſt no *Fixt Salt*, as it hath alſo loſt almoſt all its Weight.

Having thus ſhewed, that before *Incineration* there is found in mixt Bodies no *Fixt Alcalizate Salt* at all, and how the *Volatile Salts*, by *Calcination*, are brought to *Fuſion* and ſo *Fixed*; the Author further to make out the *Fixation* of ſuch *Volatile Salts*, takes notice of the Mixture of *Earthy* parts in ſuch Bodies, ſome of which, when thoſe two *Volatile Salts*, thus opened by the *Fire*, Act on one another, are *Coagulated* with them. Which he conceives to be the Caſe, when the ſaid two *Salts* being Concreted in the *Kidneys*, they by their aſperity Wound the Sanguineous Veſſels (whence the *Nephritique Pain*,) and ſo *Coagulate* together with them the Extravaſated Blood, which makes the *Stone* of the *Kidneys Reddiſh*; as the *Stone* of the *Bladder* is *Whitiſh* from the Mucous Subſtance of the *Bladder*, therefore given it by Nature leſt the ſharp *Urine*, by working upon its Membranes, ſhould cauſe Pain, being *Coagulated* together. And ſo he obſerves that the *Stones* concreted in the *Bladder* of *Gall*, Taſt bitter by reaſon of the *Gall* that is *Coagulated*.

This *Earth* then, when by the *Fire* 'tis intimately united with the *Salts*, and has been in a manner *vitrify'd* with them, keeps them ſo cloſe together, that they can no more Riſe and fly away than Birds faſtened to a Rock; thoſe *Salts* being rendred ſo *Fixt*, that by a gentle *Fire* they are not ſo much as at all Moved; by a ſtrong one, brought to *Fuſion*; and, united with a conſiderable quantity of *Earthy* particles, by an extream Degree of Heat *Vitrify'd*. So if you mix *Fixt Salt* of *Tartar* with *Cinnabar* of *Antimony*, or with *Quick-Silver*, all the *Quick Silver*, though a very Ponderous Body, will paſs into the *Retort*, but the *Salt* of *Tartar* by reaſon of its *Earth* remain at the Bottom of the Veſſel. Whence he eſteems it Evident, that the *Fixt Alcalies*, eſpecially that of *Tartar*, cannot by reaſon of the *Colliquation* of the *Earthy* parts, penetrate into Bodies to be Diſſolved, nor conſequently remove the inmoſt Seeds of Diſeaſes.

Now, in the *Second place*, though the *Volatilizing* ſuch *Fixt Salts*, and particularly that of *Tartar*, have been hitherto found a very difficult work; yet doth our Author conceive it would be very eaſie, if we took but Nature for our Guide, and but ſeparated from *Salt* of *Tartar* the *Fixing Earth*, that has been proved to be mix'd with it. For the doing of which he refers to the preſcript of Dr. *Langelot*, requiring that the *Fixt Salt* of *Tartar* be mix'd with its genuine *Ferment*, viz. *Crude Tartar*, or (if in the *Fermentation* you have a mind to ſee the *Grape like Bubbles*) *Cream* of *Tartar*, and ſo expoſed to *Fermentation*. In which Commixture of *Ferment*, he would have this eſpecially obſerved, that it be mixt to the very degree of *Saturation*, and until the *Fermenting* Agitation and the Motion of the *Saline* Particles do ceaſe, as a Sign that there is not any Particle of the *Fixt Salt* of *Tartar* left unconjoyned

Vid. Sup Sect. 4.

ed with the *Acid* Particles of the *Crude Tartar* or its *Cream*, nor any *Acid* part of the *Crude Tartar* not Saturated by the *Fixt Salt*. Which being observed, the *Diſtillation* will, the action of the *Saline* particles being thus ſtopp'd, the more ſecurely be done. Mean time, that only the *Acid* Particles of the *Crude Tartar* are laid hold on by the *Fixt Salt*, and not the *Alcalizate*, he promiſes a Proof of hereafter.

But ſince the main Queſtion is about the *New Volatilization* of the *Fixed Salts*, the Author is altogether perſwaded, that in his *Fermentation* of *Tartar*, 'tis not chiefly the very *Fix'd Alcali* of *Tartar* that is again *Volatilized*, but rather the added *Ferment*, which is the *Crude Tartar*. For in this *Crude Tartar*, though there be no *Fixt Salt* in it, (which he hath aſſerted generally of all Mixts,) yet the *Volatile Alcalizate* particles of the *Tartar* are detained by the *Volatile Acids* of the ſame, commixed with it to the very degree of Saturation; whence they are *Fix'd*, for as much as theſe two when conjoyned do *Fix* one another, when ſeparated, become again *Volatile*. Which manner of *Fixation* he calls *Natural*, being ſhew'd us by Nature; as that, which is made by the *Colliquation* of the *Earth* by Fire, *Artificial*, becauſe only performed by Art, upon the Account of which, *Volatile Salts* are detained no otherwiſe, than Birds tyed to a Rock are reſtrained from flying away.

Now, though indeed the *Fixed Alcali* of *Tartar* is in this *Fermentation* freed from that *Earth*, to which by the *Fuſion* of the *Fire* it was intimately United; yet notwithſtanding this, 'tis *Fix'd* again, ſaith he, by the *Acid* of the *Tartareous Ferment*. For the clearer Proof of which, he makes uſe of the *Urinous Spirit* of *Sal Armoniac*, in which there are two *Volatile Salts*, an *Urinous*, and *Acid*. Theſe two *Salts*, ſaith he, though they be *Volatile* when Separate, yet when United they detain one another, emulating as 'twere the Nature of *Fixt* ones, ſince they are neither Diſſolved in the Air, nor Emit any Odour, as true *Volatiles* are wont to do. Now to obtain out of this *Salt* the *Urinous Volatile Spirit*, there is requiſite a Separation of theſe 2 *Salts*; for this Bond being Diſſolved, the *Urinous* immediately riſeth. To obtain which, Water is poured upon the *Sal Armoniac* (becauſe *Salts* Act not but when Diſſolved,) and then there is added a *Fixt Sal Alcali*, which whilſt 'tis joyn'd with the *Acid* portion of the *Sal Armoniac*, (for the more *fixed Acid* is ſooner United with the *Fix'd Alcali*, than with the *Volatile*,) the *Volatile Urinous* part quickly deſerts its fellow *Acid*, and being conjoyned with the Water, yields a moſt *Volatile* and Piercing *Spirit*, which, tho' the *Sal Armoniac* before the commixture of the *Fixt Salt* was quite Inodorous, yet now after the Addition thereof ſtrikes the Noſe moſt Violently, and that even when put from the *Fire*; inſomuch that if you do not, after the mixing of the *Fixt Salt*, very accurately cloſe your Veſſel, you will afterwards find no *Spirit* at all. Wherefore as in this Example of *Sal Armoniac*, the *Fixt Salt* added, freeth the *Alcalizate* portion of the *Salts*; ſo in this *Fermentation* of *Tartar*, the *Tartar Calcined to Blackneſs*, of the *Fixt Salt* of *Tartar*, freeth the *Alcalizate* part of the *Crude Tartar* from the *Acid* parts. For, ſaith he, in the *Crude Tartar* or its putrified *Creme* there are, as in *Sal Armoniac*, two *Volatile Salts*, an *Alcali*, and an *Acid*, from the *Colliquation* of

which, (as hath been ſaid) the *Fixt Salt* reſults: ſince 'tis notorious, that in the *Fermentation* of *Wine* the *Acid* particles do *Coagulate* the ſuperabounding *Alcalizate* with the *Terreſtrial* ones to the very degree of Saturation, and ſo by their increaſed Weight take place in the lower part of the Veſſels.

If therefore to this *Tartar*, pregnant with *Salts*, *Crude* or *Depurated* by a Solution in Water, you add a *Calcin'd Tartar*, or, which is the ſame, *Salt* of *Tartar* it ſelf, immediately this *Fixed Salt* will lay hold on the *Acid* Portion of the *Crude Tartar*, and, as in the *Sal Armoniac*, ſo here, free the *Volatile Alcalizate*; from which conflict and action of the *Salts* on one another, *Grape-like Bubbles* will ariſe. And this Injection of *Calcin'd Tartar* muſt be continu'd, until all *Fermentation* do ceaſe, that is, to the very degree of Saturation: Which unleſs it be well obſerv'd, many Inconveniencies will obſtruct the Operator. But this *Volatile Alcali*, being by means of the *Calcin'd Tartar* freed from its *Acid*, (like the *Urinous* of the *Sal Armoniac*,) will preſently fly away. Wherefore if this *Volatile Spirit* could forthwith be received, it would afford a real *Volatile Salt* of *Tartar*, eſpecially if by Art it were freed from its *Phlegme* (which makes it a *Fluid Spirit*,) and without the Addition of any extraneous thing, *Coagulated* into *Salt*. But this cannot be, ſaith he, ſeeing that, before all the *Fermentation* and Motion of the *Saline* Particles ſhall have ceaſed, this *Mixture* cannot be put into the *Cucurbite*, becauſe it would break the Veſſel; nor can the *Fixt Salt* be added to the Diſſolved *Crude Tartar* all at once, but at ſeveral times, becauſe elſe all the *Fermented* part would quickly get out at the edges of the *Cucurbite*: Now then, ſince every time there is, by the Addition of *Fixt Salt*, ſo much of the *Volatile Acid* free'd out of the *Crude Tartar* as much as there is Added of *Fixt Salt*, and that preſently flies away, it certainly follows, That, if by Injections ſeveral times repeated you come at laſt to the Point of *Saturation*, there will remain no *Volatile Alcalizate Salt* at all of the *Crude Tartar*.

Since therefore there is no hopes of obtaining the *Volatile Salt* from *Crude Tartar* this way, we muſt endeavour to get it by an Addition of *Tartar Calcin'd*, or *Fixt Salt*; and how this is to be done, hath been already intimated, *viz.* by the Separation of the *Earthy* parts. For as the *Volatile Alcalizate* particles, upon a very vehement *Colliquation* of the *Fire*, are, by an intimate Union with the *Earthy* parts, kept from Aſcending; ſo alſo, when freed from theſe *Terreſtrial* Fetters, they are reſtored to their former freedom and *Volatility*. And this Separation of the *Earth* we obtain by this *Fermentation* of the *Tartar*; for, in the ſame moment that the *Acid* portion of the *Crude Tartar* is conjoyn'd with the *Tartar's Fixt Salt*, to ſet the *Volatile Alcali* of the *Crude Tartar* at liberty; there is alſo made a *Precipitation* of that inſipid *Earth*, which by the extream degree of *Fire* was United with the *Salt* of *Tartar*, and had *Fix'd* it before.

But to expoſe this *Fixing Earth* to the view of all, I ſhall alledge the Example of *Vitriolate Tartar*, known to the very Apprentices of *Apothecaries*. In this Operation whilſt the *Spirit* of *Vitriol* is affuſed to the Diſſolv'd *Salt* of *Tartar* or its *Oil* made *per deliquium*, you may obſerve a very great *Effervescence*,

ſcence, during which and the Action of the *Acid* of the *Vitriol* upon the *Alcali* of the *Tartar*, there is *Precipitated* an *Earth* (for the Separation of which, care is to be had of the Degree of *Saturation* between the *Spirit* of *Vitriol* and the *Salt* of *Tartar*,) which afterwards may be ſevered by *Filtration*. Now that this *Earth* is *Precipitated*, not out of the *Spirit* of *Vitriol* but rather the *Salt* of *Tartar*, none, vers'd in theſe things, can be ignorant of. This *Precipitated Earth* ſome call the *Magiſtery* of *Vitriolate Tartar*, and very impertinently prefer it often in their Preſcriptions to the true *Vitriolate Tartar* it ſelf. This *Earth* indeed hath a *Saline Taſt*; but theſe *Salts*, as is uſual in all *Precipitations*, did only adhere to the matter *Precipitated*, and may, by a repeated Ablution, be eaſily Separated; which done, there remains nothing but an utterly *Inſipid Earth*, which can have no other Vertue but that of *Exſiccation*. Wherefore after the ſelf ſame manner, whilſt the *Acid* part of the *Crude Tartar* is United with the *Alcalizate* of the *Salt* of *Tartar*, the *Earth* alſo of the *Fixt Salt* of *Tartar* in the ſaid *Fermentation* will be *Precipitated*.

The greateſt difficulty being thus diſpatch't, our Author proceeds, in the 3*d. Place*, to a leſſer yet remaining, which is; That the *Acid* part, by means of which, the *Earth* was *Precipitated*, detains the *Volatile Alcalizate* part, and *Fixeth* it anew; ſo that his *Volatile Salt* of *Tartar* hath hitherto acquir'd no greater degree of *Volatility*, than *Crude Sal Armoniack* or the *Flowers* thereof are known to have. For theſe, though they are made up of *Volatile* parts, yet they diffuſe no *Odour* before the Separation of the *Volatile* parts; they alſo endure the *Air*, which no *Volatile Salts*, truly ſuch, will do: Wherefore they cannot yet be reckon'd among *Volatiles*, ſtrictly ſo call'd.

Now then, to give to this *Volatile Alcali* of *Tartar* the laſt and higheſt degree of *Volatilization*, the Author eſteems it neceſſary that there ſhould be made a new Addition of *Fixt Salt* of *Tartar*, which in the ſame manner as before it had free'd the *Alcalizate* part of *Crude Tartar* from its *Acid*, muſt here alſo take from the manifeſt *Acid* of *Crude Tartar* the *Alcalizate* part of the *Fixt Salt* of *Tartar*, already freed from *Earth*; whereby this *Alcalizate* part of the *Salt* of *Tartar*, truly *Volatilized*, being joyned to the Water (which was before Added for the free Action of the *Salts*,) will conſtitute a moſt *Volatile Spirit*, which, he ſaith, is *Coagulable*, without Addition, into *Volatile Cryſtals*, having the perfect Taſt of *Tartar*.

An Odd Salt Extracted out of a Metallick Subſtance; by P. Fr. Lana. n. 79. p. 3060.

VI. P. *Fr. Lana*, having Extracted out of a *Metallic Subſtance* a very white *Salt*, the ſame was, upon the Application of the Gentleſt Heat, Reſolv'd into a *Golden Colour'd Liquor*; which being Remov'd from that Warmth, as ſoon as it felt the Cool Air, and even by opening the Glaſs wherein it was inclos'd, did in a Moment *Shoot* afreſh into the ſame *Salt*; and that (which ſeem'd *oddeſt*) whilſt he was pouring it out of one Glaſs into another during its Fluidity, it was diſpers'd all over the Glaſs it was pour'd into, ſuddenly *Congealing* into moſt Fine Threads, many of which were extended from one ſide of the Glaſs to the other, and hanging as 'twere in the Air, Form'd juſt like the ſubtileſt Cob-webs, not at all Rigid, but by reaſon of their exquiſite Subtilty Pliable, and ſcarce perceivable by the Eye.

VII. Take

Volatile Salt *and* Spirit *extracted out of all sorts of* Plants; *by Dr.* Dan. Cox. n. 100. p. 7002. n. 101. p. 4.

VII. Take in warm Weather a conſiderable Quantity of the *Leaves* of any *Vegetable*, ſtripped or pulled from the greater Stalks; lay it on a heap, preſſing it pretty cloſe together; They will ſoon become very Hot, eſpecially in the middle, and after a few days Reſolve into a Pappy Subſtance (excepting the outward Leaves,) which being made into Pellets, and put into a *Glaſs Retort*, and *Diſtilled*, will yield, beſides a great quantity of *Liquor*, much thick Black *Oil* of a Balſamick Conſiſtence. The *Liquor* being ſeparated from the *Oyl*, and *Diſtilled* in a tall *Glaſs-body*, a *Volatile* Spirit *Sublimes*, which, after one, two, or three *Rectifications*, becomes perfectly *Urinous*, not to be diſtinguiſht, by *Smell* or *Taſte*, from *Well-Rectified Spirit* of *Harts-horn*, *Blood*, *Urine*, or *Sal Armoniac*.

I never made Tryal of any *Herb*, which, thus ordered, did not yield the mentioned Subſtances; altho' I have examined many by this method of procedure, which ſeemed very different from each other, as well in Senſible Qualities, as thoſe vulgarly called Occult; ſuch as *Rue*, *Sage*, both *Celandines*, *Carduus benedictus*, *Tobacco*, *Stinking Orach*, *Garden Scurvy-graſs*, *the leſſer Spurge*, *Baum*, *Mint*, *Tanſy*, *Camomil*, *Monk's Rhubarb*, ſeveral *Docks*, and even Common *Graſs*, with many others, which it were altogether unneceſſary to enumerate; beſides *Flowers* of *Elder*, *Pæony*, *Cowſlips*, *Clove Gilliflowers*, *&c.* with ſeveral ſorts of *Moſſes*, and *Rudiments of Vegetation*; which laſt is a green Subſtance on the Surface of the *Earth*, in *Rivers*, *Ciſterns*, where Rain often falls, and on *Ships* between Wind and Water, very apt to run into *Moſs* and *Fibres*.

Note 1. The *Veſſels*, wherein theſe *Diſtillations* were performed, though exceedingly well waſhed with Water, ſcowred with common Salt, Sand, Aſhes, Soap, fixt Salts, *&c.* and afterwards expoſed many Years unto the Air, Wind, Rain, Dews and Froſts, yet never the leſs retained a very ſtrong *Smell*, not much unlike that of *Musk*.

2. The *Water* left at the bottom of the *Glaſs*, after the firſt *Rectification*, was ſomewhat *Acetous*; eſpecially when the *Herbs* were not ſufficiently *Fermented*.

3. If the *Herbs* are duly *Fermented*, they leave little *Caput Mortuum* ſometimes not a 20*th*, and never, by my Trials, above a 10*th* part; whereas *Diſtilled* before *Fermentation* they leave much more: And this remaining *Coal*, burnt to Aſhes, yields ſcarce any *Alcali* or *Fixt Salt*.

4. The *Volatile Salt* is much more than the *Fixt Salt* would have been, afforded by the Herb *Incinerated* the ordinary way.

5. All thoſe *Herbs* which yield ſtore of *Fix'd Salt* (ſuch as *Wormwood*, *Carduus*, *Mugwort*, *Sage*, *&c.*) do likewiſe, being thus managed, afford plentifully a *Volatile Salt*.

6. Theſe *Volatile Salts* being highly *Rectified*, did not, that I could perceive, *Differ* from each other; as neither do *Vinous Spirits* of *Fermented Vegetables*, or their *Fixed Salts* highly Purified and Rectified.

7. During the *Fermentation*, the Room would be ſtrongly perfumed at the Beginning with the *Natural Scent* of the *Herb*, if it had any eminently peculiar

peculiar *Smell*; in the Middle, with the *Scent* of a mixt between that and the *Urinous*: But being well putrified, became ſenſibly *Urinous*.

8. The *Diſtilled Liquor* of ſome *Herbs*, at the *firſt Rectification*, yielded a *Spirit* very Hot; but the *laſt* inclined rather to that of pungent *Vinous* Spirits of *Scurvygraſs*, *Horſe-radiſh*, *&c.* being, if I may ſo ſpeak, *Piperaceous*, and Biting, rather than like *Volatile Salts*; but after *repeated Rectifications*, one, two, or more, according to the Nature of the Plant, or time it had *Fermented*, became perfectly *Urinous*. This was uſually, when the *Herbs* had not duly *Fermented*; which proceeded in my Apprehenſion, from ſome Commixture of *Eſſential Oyl*, which by reiterated *Rectifications* is either Separated or Tranſmuted. The ſame happens in the *Vinous* Spirits of *Fermented Vegetables*, and in their *Fixed Salts*.

9. In the *Diſtillation* of the *Putrified Herbs*, the *Urinous Spirits* and *Salt* came chiefly at the latter end with the *Oyl*, in the form of a thick white Cloud or Fumes, and condenſing in the *Recipient*, formed an innumerable Company of vey Irregular Crooked Rivulets, exactly after the manner of *Harts-Horn*, *Blood*, *&c.* and at the beginning came the *Phlegme* with moſt of the *Acetum* in great Drops with little Fume, and the Rivulets Straight, and without *Striæ* and Wandrings.

10. Some *Herbs*, as *Winter-Savory*, *Sage*, &c. in the *firſt Diſtillation* yielded copiouſly a *Volatile Salt* in a Dry form, which did coat the *Receiver*, and *Sublimed* into the *Neck* of the *Retort*: So doth *Toabacco*; and once *Saffron* did ſo, in *Digeſtion* with *Spirit* of *Wine*.

11. All *Plants*, thus *Fermented*, yielded plentifully, (eſpecially toward the latter end of the *Diſtillation*) a *Fœtid* Groſs *Oyl*, which, if the *Herb* was well *Putrified*, did not in the leaſt reſemble the Plant which produced it; I could hardly perceive, that they *Differed* from each other in either *Taſt* or *Smell*: only, if the Plant was not throughly *Fermented*, an *Oyl* would come over at the beginning of the *Diſtillation*, which, as alſo the *Water*, would retain exactly the *Taſt* and *Smell* of the *Vegetable* which afforded it; and it would be Fluid and Tranſparent, like other *Eſſential Oyls*. The *Oyl* of Herbs very well *Putrified* came over chiefly at laſt, and did require a very ſtrong *Fire* to extricate it out of the Herb; was moſtly, eſpecially that which comes laſt of all, of the Colour and Conſiſtence of *Tar*, very Tenacious, and did far and wide emit a very Odd, Faint, *Fœtid*, Offenſive, *Odour*: If any thing became infected by this *Oyl*, it was not to be freed from it in a long time.

12. *Herbs*, which *Diſtill'd* in an *Alembic* with Water yield little *Eſſential Oyl*, as *Baum*, *Mint*, *Camomil*, &c. afford much of it thus *Fermented*: And thoſe, that give much *Eſſential Oyl*, as *Wormwood*, with many others, being *Putrify'd*, yield abundantly more.

13. During *Putrefaction*, the *Herbs* became exceedingly *Hot*, eſpecially thoſe that were cloſely Compreſſed and had ſtore of Moiſture in them; ſo that I could as well detain my Hand in the Flame of an ordinary Fire, as in the midſt of them.

14. Fatty, Moiſt, and Inſipid *Herbs*, *Ferment* much ſooner, and with greater *Heat*, as *Graſs*, *Docks*, *Garden Scurvygraſs*, *Celandine*, &c. Drier

and

and much more Sapid Plants more leisurely, and with less *Heat*, as *Winter-Savory*, *Rosemary*, *Sage*, *Rue*, *Mint*. The *Stalks* of no *Herbs Ferment* so soon as the *Leaves* free'd from them. This is most evident in *Docks*, whose tender parts are Pappy and Mucilaginous, when the *Stalks* are entire.

15. *Herbs*, seem by this *Putrefaction* to be depriv'd of all their *Specifical* or peculiar Properties: *Celandine* looses its *Tinging* quality; *Spurge*, its *Milk*, *vesicating* and *poysonous* Nature, *&c.*

16. *Herbs*, which before *Putrefaction* were extremely *Fetid*, as *Atriplex Olida*, &c. became afterwards either *Inodorous* or not Ill Scented: And, on the contrary, *Monk's Rhubarb*, *Garden Scurvy-Grass*, with many other *Inodorous* Vegetables, during *Putrefaction* became abominably, and almost insupportably *Fetid*, like the worst of Excrements; all which yet they lost immediately upon *Distillation*.

17. None of those *Flowers*, I have hitherto used, do *Stink* in *Fermentation*.

18. Many of the *Herbs*, thus *Putrified* or *Fermented*, swarm with *Maggots*, (an Argument of the close and stedfast Contexture of the Seminal Principles in *Insects*) especially at the bottom, and in the middle, whither *Flies* and other *Insects* can have no Access to Deposite their *Eggs*, and where the *Heat* is so violent, that they could not possibly Subsist.

19. Yet the *Volatile Spirit* and *Salt* is not afforded by these *Insects*: For, having *Distilled* Separately a great quantity of them, they yielded no *Volatile Salt* or *Spirit*, but a *Liquor* of a very different Nature.

20. *Herbs Fermented* in a great *Glass* with a narrow *Neck*, the Mouth left open, in a few Weeks became, for the greater part a *Mucilage*, and *Distilled* a Year after they had stood so open, yielded a little *Urinous Spirit*, but not a Drop of *Oyl*.

21. *Vegetables*, if the external Air be excluded from them, will not *Putrify* or *Ferment*.

22. Some *Herbs*, *Mosses*, and *Rudiments* of *Vegetation*, yield a *Volatile Salt*, *Distilled* without previous *Fermentation*; as do also many *Seeds*, and several of them sufficiently *Insipid*.

23. These *Volatile Spirits* and *Salts* have not only the same Sensible Properties; but also agree in all known Effects and Operations with common *Urinous Spirits* and *Salts*; as, in the changing *Syrup* of *Violets* and many other *Vegetable Tinctures* Green; in being *Diaphoretick*, *Diuretick*, and *Deobstruent*: Contrary to *Acids*, which they do *Mortify*; *Precipitate* all Metals and Minerals Dissolved in *Acid Menstruums*; being highly *Rectify'd*, and Mixt with perfectly *Dephlegmed Spirit* of *Wine*, strike the *Offa alba*, as Chymists speak: They Unite with *Acids*, and thereby become *Armoniack*, or *Neutral Salts*; and indeed perform whatsoever can be expected or desired from the common *Urinous Spirits* of *Salts*.

No Alcalizate Salt *in any Subject before the* Action *of* Fire *upon it*; *by Dr.* Dan. Cox. *n.* 107. *p.* 150.

VIII. 1. The *Alcalizate* or *Fixed Salts* of *Plants*, extracted out of their Ashes after *Incineration*, or out of *Tartar* Calcin'd, do, in my Apprehension, neither *præ-exist* in the *Vegetables* that afforded them, before they were exposed to the *Action* of the *Fire*; nor do they *Differ* considerably, (I am certain, not *sensibly*) from each other.

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The former part of this Poſition may be thus made oút.

1. I never yet found, that any *Vegetable* (or indeed *Animal*, or *Mineral*) Subſtance did in the leaſt meaſure manifeſt to the Taſt, or by its Effects, that it contain'd any ſuch *Salt*. Many *Plants* and *Roots*, lightly bruiſed, affect the Eyes and Noſe after the manner of *Volatile Salts*, and ſeveral do bite the Tongue, and ſtrike upon the Palate. Some *Herbs* yield a copious *Volatile Salt* immediately after they are preſſed by a conſiderable degree of *Heat*: And many ſorts of *Earths* do abound therewith; ſo that it is highly probable, they do often actually exiſt in *Vegetables*, in the very ſame form, wherein they appear to us upon *Diſtillation* from the *Herbs* themſelves, or from *Soot*. And that *Acid Salts* do really exiſt in many *Plants*, is diſplayed by their Taſts and Effects. They may be alſo obtained without *Fire* or any Artificial *Analyſis*, as is evident in *Tartar*, and the reputed *Eſſential Salts* of many *Plants*; in *Verjuice*, *Vinegar*, and *Verdegris*, whoſe *Acidities* may be concentred, and made to appear in a Dry form. Now did *Alcalies* exiſt in the *Plants* before the *Analyſis*, eſpecially ſo copiouſly as they ſometimes appear afterwards, certainly they would betray themſelves by ſome viſible ſenſible Property, or other Symptom of their preſence.

2. Did *Alcalies* præexiſt in *Plants*, probably *Animals*, whoſe ſole Food they are, would alſo abound therewith; whereas on the contrary we do not find the leaſt foot-ſteps thereof, either in *Blood*, *Urine*, *Bones*, *Horns*, &c. which do all abound with *Volatile Salts*: nor in ſome other parts, Excrements, and Juices, that afford ſtore of *Acidity*, which may frequently by *Coagulation* be brought to a *Saline* form or conſiſtence. Nor can it reaſonably be pretended, that the *Ferment* of the Stomach and other parts, ſeveral Digeſtions and repeated Circulations, have alter'd its property, and at length render'd it *Volatile*; For, *Firſt*, *Alcalies* ſeem to be of a very *Fixed* Nature, and are not eaſily *Volatilized*: And daily Experience will evince, that the Chyle doth not in the leaſt participate, either in Taſt, or any other property, with *Alcalizate Salts*. Beſides, *Herbs* taken out of the *Omaſus* of *Ruminating* Animals, without any further Digeſtion or Preparation, yield a *Volatile Salt* as when *Fermented* or Putrify'd in the open Air, without Additament.

3. Moſt *Vegetables*, whether Woods or Herbs, if Burnt whilſt they are Green, and with a ſmothering Fire, yield *Salts* which are far enough from *Alcalizate*; being either *Neutral* or *Acid*, or, to ſpeak more properly, *Tartareous*: For they do almoſt exactly reſemble Putrify'd *Tartar*; and *Diſtilled* yield the very ſame Subſtances. Indeed, ſome few Herbs, ſuch as *Satureja*, *Roſemary*, &c. which abound with ſprightly *Volatile Oyl*, if they are well Dryed, upon ſimple *Incineration* yield an *Alcalizate Salt*: ſo do ſome Dry Woods. But, that they are produced by the *Fire*, and not ſeparated, I ſhall anon prove from Experiments, I think, unqueſtionable and unanſwerable.

4. In the moſt natural method of *Analyſing Plants*, which is by *Fermentation* or *Putrefaction* without Additaments, or the intervening of a ſuſpicious *Analyſer*, we receive *Oyl*, *Acid Spirit*, and *Volatile Salt* copiouſly; all

which did evidently præ-exiſt. But if the Herbs, are perfectly or intirely *Putrified*, little or no *Alcali* can be extracted from them; as neither from Rotten or *Putrified* Wood; the Active *Salts*, by whoſe *Combination* the *Alcali* is produced, being either Expired or Evaporated.

Next, I am to enquire, How the *Fire* produces this *Alcali:* Whether by the *Changing* of one ſingle præ-exiſting Principle; or by enabling any among them to make ſo notable an Alteration upon or in the other? or laſtly, Whether it is effected by the Union of two or more active Principles, which thereby become different from what they were before the ſaid *Combination?*

I ſhall not at preſent trouble you with the Reaſons, Experiments, and Obſervations, which have induc'd me to reject the former; but, briefly ſuggeſt thoſe, which incourage and diſpoſe me to believe and Aſſent to the latter: So that this is my Poſition; That *Alcali Salts* do reſult from the *Combination* or *Union* of the *Saline* and *Sulphureous Principle.* But whether it is the *Volatile* or *Acid Salt*, which *Combines* with the *Oyl* of *Sulphur*, is now the Subject of our Inquiry. The enſuing Conſiderations ſeem to determine in favour of the *Acids.*

Firſt, *Tartar*, which is ſenſibly *Acid*, and from which a *Volatile Salt* cannot be Separated by any commonly known method, by bare *Calcination* becomes a ſtrong and perfect *Alcali.* *Secondly*, *Nitre*, an undoubted *Acid* with a ſmall proportion of *Mineral* or *Vegetable Sulphur*, is converted into a genuine fiery *Alcali.* *Thirdly*, *Nitre*, which is made by the Affuſion of an *Acid Spirit* upon an *Alcali*, may be almoſt totally Diſtilled into an *Acid Spirit*, there appearing not the leaſt Footſteps of a *Volatile Salt*, and ſcarce any of the *Alcali*, out of which it was chiefly produc'd.

But theſe are very weak and inconſiderable, compared with Arguments, which neceſſitate me to believe, that it Emerges from the *Union* of the *Volatile Salt*, with the *Oleaginous* or *Sulphureous* Principle. For,

1. There ſeems to be a great Contrariety between *Acids* and *Alcalies*: Being mixt, they Heat, Fight, and Mortify each other; whatſoever one Diſſolves, the other Precipitates: Whereas, were the *Salt* of *Alcalies* of a nature approaching to *Acids*, they would more plainly *Unite* without the violent Contention, which uſually enſues.

2. *Alcalies* and *Volatile Salts* agree in moſt Properties, excepting their Different Degrees of *Gravitation.* They are both *Diuretical* and *De-obſtruent*; they both Diſſolve *Sulphureous* Bodies; agree in their Contrariety to *Acids*, but Mix together Quietly without Noiſe, Heat, Ebullition, or imparing each others Vertues, and are eaſily Separable; the ſame in Quantity and Quality they were before Mixture.

3. *Tartareous* or *Eſſential Salts* of *Vegetables* cannot become *Alcalies*, until their *Acidity* be driven away; during which Operation the *Volatile Salts* and *Oyl*, Uniting, become more Ponderous than the *Acid*, which before did Gravitate more than either of them in their ſeparate ſtate: So that ſuch a *Degree* of *Fire*, as will wholly Diſſipate the *Acid Spirit*, cannot Elevate the more Ponderous *Alcali.* Not but that, contrary to that which is commonly aſ-

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ſerted, the moſt *Fix'd Alcali* may be Sublimed to a great height without Additaments, by an Intenſe *degree* of Heat: For, I have frequently reduced a *Pound* thereof unto 3 or 4 *Ounces*, and recovered a conſiderable Proportion which was caught in well contriv'd Veſſels, ſome Yards above the Crucible, little, if at all, altered from what it was immediately before it ſuffered this *Violence*. Upon this Account chiefly it is that *Soot* yields ſome ſmall Quantity of an *Alcali*, eſpecially that neareſt the *Focus*.

4. *Alcalies*, may be divided into *Oyl* and *Volatile Salt* by facile and natural methods of Procedure. I my ſelf have many times effected this in part: And a very worthy Perſon, in whom I can perfectly Confide, aſſured me, he hath frequently Reſolved the whole Body of *Alcalies* into the two diſtinct Subſtances of *Volatile Salt* and *Oyl*; receiving of the latter a ſmall Proportion: Which is alſo confirm'd by thoſe Tryals I have made on the ſame Subject.

I could ſuggeſt many more Arguments and Experiments; but theſe being ſufficient, and, I think, indiſſoluble, I proceed to confute the Pretenſions of *Acid Salts* to an Intereſt in this new Production. *Firſt*, What concerns *Tartar*, its *Acidity* is driven away in great quantity before it can become *Alcalizate*; and a *Volatile Salt* may, to my Knowledge, be by divers Methods Separated from it. *Secondly*, as to *Nitre*, though that in *Diſtillation* yields an *Acid Spirit*, yet it abounds alſo in *Volatile Salt*; as I could Demonſtrate from the manner of its Generation, and from Irrefragable Experiments. And beſides, perhaps in the Operation of the *Sulphur* on the *Acid Salt*, ſuppoſing it ſuch, there is a Comminution of its parts, and thereby that made a *Volatile Salt* which was before *Acid*, only Magnitude diſcriminating between them.

2. I have aſſerted above, That *Alcalizate* or *Fixed Salts* extracted out of the *Aſhes* of *Vegetables* do not *differ* from each other; as neither their *Vinous Spirits*; yet with this Reſtriction, if they were *highly rectify'd* or *purify'd*: And I may Add nor *Volatile Salts*, not only of *Vegetables*, but even thoſe yielded by *Animals* or *Minerals*, with the before-mention'd Limitation of due *Purification*.

No ſenſible Difference among the Fixt *and Volatile Salts and* Vinous Spirits, *by Dr.* Dan. Cox *ib. p.* 154.

Firſt then, I ſay, That *Salts* perfectly *Alcaliz'd differ* not from each other in Senſible, nor, (ſo far as I have had Opportunity to enquire) in Hidden, properties. It hath been a conſtant and general perſwaſion that many *Fixt Salts* do retain, ſome at leaſt, the *Spicifical Properties* of thoſe *Vegetables* out of whoſe Aſhes they were extracted. The *Salt* of *Wormwood*, and *Mint* are ſaid to be Stomachical; that of the greater *Celandine* proper for *Attericks*; thoſe of *Broom*, *Aſh-Keys*. *Elder*, *Bean-Stalks*, &c. Dieuretical; of *Roſmary*, *Sage*, &c. Cephalick; and others, (too many now to enumerate,) which are thought to be endowed with very different Medicinal Properties. I am not very forward to Queſtion and Quarrel with Opinions and Maxims eſtabliſh't by univerſal Conſent, and confirm'd by the Experience of many Ages, unleſs I have ſufficient Reaſon to diſtruſt their Veracity and Validity. In the preſent Caſe, the Perſwaſion of the Ancients,

Vid. Sup. Sect. VII. 6.

and the Poſition which I ſhall endeavour to illuſtrate, though at the firſt Appearance they ſeem Diametrically oppoſite, may be eaſily reconciled. I formerly declared, that moſt *Vegetables*, Burnt whilſt Green or Moiſt, and with a ſmothering Fire, yield a kind of a *Neutral Salt*, which may be call'd *Tartareous*, and ſometimes not improperly *Eſſential*, many of them retaining the *Vomitive*, *Purging*, *Sweating*, *Diuretical*, *Opiate*, or other general, and perhaps ſome Specifical, Properties, wherewith the *Plants* were Enobled which produced them. Now, whether 'tis ſome ſmall quantity of *Eſſential Oyl*, which mixt with the *Saline* Principle renders it ſo variouſly Medicinal, the *Eſſential Oyls* of *Plants* being manifeſtly as 'twere a Compendium of the Plant, which they do equally exactly reſemble in Smell, Taſte, and other Qualities: Or, whether thoſe Vertues are the reſult of the *Craſis*, and Mixture of the ſeveral Principles; certain I am, that after the *Oyl* is evaporated by an Intenſe Heat, or the *Craſis* diſturbed by Avolation of ſome parts, and new Combinations of what Remains, farewell all *Specifical* Qualities, and conſequently all other *Differences*, than what Purity and Impurity, and ſeveral degrees of Heat may occaſion; ſome being more White and Fiery than others. Now, ſome *Salts* are much more eaſily depriv'd of their *Acid* and *Oily* parts than others; and in ſome, on the contrary, the *Oyl* is of ſo *Fixt* a Nature, or rather ſo cloſely combin'd with the other Principle, that it muſt be a very Intenſe Heat which can disjoyn them, and thereby reduce the *Salt* to the common Standard or Aggregate of Qualities, wherein all *Alcalies* agree.

The Induſtrious *Tachenius* does ſomewhere pretend to Demonſtrate, that there is a real *difference* between the *Alcalies* of Different *Plants*; which he would prove by the various Effects they have upon a Sublimate Diſſolved in common Water. But this is eaſily Reſolved by what I before ſuggeſted; as alſo by an eaſy obvious Experiment, which may at any Seaſon in any *Plant* be readily Proved. Take what *Wood* or *Plant* you pleaſe, *Burn* it *Green*; the *Salt* being extracted out of the *Aſhes*, will according to the Different Degrees of Fire whereunto it ſhall ſucceſſively be expoſed, variouſly influence the *Mercurial* Solution, the ſeveral *Precipitates differing* no leſs from each other, than when made with the *Salts* of *Different Plants*.

This is alſo moſt evident in *Tartar*, which the leſs and more gently it is Calcin'd, the more *Salt* it yields; and on the contrary, a much ſmaller Proportion, if ſuddenly and with the Higheſt Degrees of Heat. That which is prepared by the former Method, is Mild and Gentle; its Taſte approaching ſomewhat towards that of *Acids*; whereas the other, which hath paſſed through the Violence of Fire, hath not the leaſt Affinity therewith, and can almoſt as little be Endured by the Tongue as a Live Coal of actual Fire. And there being very many Degrees of Heat, whereunto the *Tartar* may be ſucceſſively expos'd, according to the ſaid Degrees, the manner of applying it, Space of Time, and Subſtances Employed in the *Calcination*; the Reſult will be Different, and produce different Effects: And the very ſame ſort of *Tartar* will oftentimes become ſenſibly *Different* upon theſe Methods of procedure, and produce moſt of the Appearances mention'd

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by *Tachenius*. And sometimes several parcels of *Tartar*, which seem to our Tast and Eye *Calcined* to the same Degree, yet the Operations in Nice Experiments are frequently Various. And to me it doth not seem so very wonderful, that many Concretes do really *Differ*, which to the Senses appear Simple and Uniform; of which many Causes may be assigned. A great Number, and Variety of Instances might be here introduced to clear this Truth, if it were not already sufficiently known and believed.

But to proceed where I Digressed; What I have *Asserted* is Confirmed by the great *Variety*, which is most visible in *Pot-ashes*: Some being Highly *Alcalizate* are very *Hot*; others *Cold*, *Watry*, *Nitrous* to the *Palute*, and no less weak in Effects than Taste; whereof *Soap-boylers*, *Dyers* and other *Mechanicks* are very sensible. All which proceeds from the Woods being, when they are *Burnt Green* or *Dry*; from their Abounding with *Oily*, *Aqueous* or *Acetous* parts; as also from the several *Degrees* of *Heat* imployed in their Production. Those who make *Glass*, and especially the finer sorts thereof, complain that they cannot with the same Quantities and Proportions of Ingredients always produce the same sort of *Glass*: Which they, not without Reason, ascribed to the *Differences* in their *Ashes*. This must necessarily often happen accordly to the lately mentioned *Hypothesis*.

That which hath been said of *Alcalizate Salts*, may likewise be Affirmed concerning *Volatile Salts*, and *Vinous Spirits*: The former are afforded not only by *Vegetables* and *Animals*, but also by some *Minerals*: And although immediately upon their Production or *Extraction* out of the several Substances, which did yield them, they appear sensiby *Different* from each other, and are without dispute endowed with very *Different* Properties, chiefly Medicinal; yet they may all by Slight Artifices be reduced into such a *Simplicity* and *Identity*, as that neither the most Acute and Faithful Senses, nor the most Rational and Nice Experiments, can find or make, without Additaments, the least Disagreement or *Discrimination*. n. 108. p. 269.

Volatile Salts abound in most *Vegetables*, from which they sometimes may be Extricated by simple *Distillation*; but usually previous *Fermentation* is required: of which *Operation* I have formerly rendered a particular Account. This *Salt* may be also obtained from *Soot*, *Urine*, the *Blood* of *Men* and other *Animals*; from *Bones*, and especially *Cranium*'s or *Skuls* of *Men*; from many sorts of *Horns*; (and indeed no subject yields them so copiously, as those which are Annually cast by *Staggs* or other *Deer*;) from *Vipers* in great plenty; as also from diverse other *Animals*. I need not here mention *Factitious Salt Armoniack*, that being a Commixture of several of the mentioned Substances with *Sea-Salt*. Also many *Minerals* and *Fossils* contain *Volatile Salt*; vast quantities of *Salt Armoniack* being found in many parts of the East, which was probably *Sublimed* into those Caverns, whence it is extracted, by the force of *Subterraneal Fires*: Which Conjecture is sufficiently authorised by the same Substances being gathered near the *Crateres* or Mouths of our *European Vulcano's* of *Ætna*, *Hecla*, *Vesuvius*, in *Campis Phlagreis*; in *England* also near the Mouth of several *Coal-Mines*, which have been accidentally Fired: And of Recent Memory that *Torrent* of *Melted Minerals*, which *Vid. Sup. Sect.* VII.

boiled

boiled over the *Crucible* (if I may ſo ſpeak) upon the late *Conflagration* in *Sicily*, and poured it ſelf into the adjacent Plains. This *Liquid Fire*, as it Cooled, Condenſing, became Cruſty at Top, and almoſt every where Stores of *Salts* were *Sublimed* or thruſt forth by the Violence and Fury of the *Heat*. Some of theſe *Salts* reſembled the Vulgar *Sea-Salt*; others *Nitre*; ſome were of an *Aluminous* and *Vitriolick* Nature; but that which was moſt Copious and Univerſal, was *Armoniack*; which although much Diſcoloured, and rendered very Impure in moſt places by its Union with various *Metallick* and *Mineral* Particles, yet did chiefly, as the *Factitious Salt Armoniack*, conſiſt of *Marine* and *Volatile*, commonly call'd *Urinous Salts*, as did alſo the forementioned; as many Experiments have informed me, too Numerous and Tedious to be here inſerted. Beſides thoſe *Mineral Subſtances* already mentioned, ſeveral ſorts of *Earths*, *Clays*, and *Marle*, which are fetcht from the Superficial or Cortical part of the Earth, do contain Store of *Volatile Salts*; which appear upon *Diſtillation*: And from ſome of them I my ſelf have frequently Separated greater Quantities than will be eaſily Credited. It would require more patience in the Reader than the Subject deſerves, ſhould I relate or particularly Enumerate the peculiar ſenſible and Medicinal Properties, whereby the *Salts* are *Diſcriminated*, which the ſeveral forementioned Subſtances do afford. I ſhall therefore at preſent only Suggeſt, what in my Apprehenſion renders them ſo *Multifariouſly different* from each other; and then diſcover, How they may be reduced unto the *ſame Common Nature*, and, if you pleaſe, being *United*, become an *Uniform* and *Homogeneous* ſubſtance; wherein I may Challenge the moſt ſevere Criticks and experienced Chymiſts, to find a greater variety of Parts and Qualities, than what is abſolutely neceſſary to conſtitute the *Eſſence* and *Definition* of a *Volatile Salt* in the *Abſtract*.

It was long ſince by the Famous *Van Helmont* judiciouſly Obſerved, and by many Experiments Confirm'd, That variety of *Sulphurs* did chiefly *Diſcriminate* the Species of *Mixt* Bodies, and that moſt of the conſiderable *Changes* which were made in or upon them, were occaſion'd by Separating their Own, or Superinducing an Extraneous *Sulphur*. If this be affirm'd of *Sulphur*, a pretended Simple Homogeneous Body, and the *2d Principle* of the *Chymiſts*, it is deny'd: But if he intended, as is moſt probable, by *Sulphur* a Subſtance, which, when Separated, is uſually inflammable, and doth ordinarily appear in an *Oleaginous* Form, I eſteem his Aſſertion very probable and Specious.

Let us make a ſhort Reflection on the *Oyls* Extracted out of *Vegetables* by the Aſſiſtance of common Water, which are as 'twere a Compendium of the *Vegetables* that afforded them, being eminently and manifeſtly Ennobled with moſt of thoſe Senſible and thoſe more Hidden Qualities that did determinate the *Vegetables* whilſt flouriſhing: Whereas their *Salts*, whether *Fixt* or *Volatile*, their *Waters* and *Earths*, can boaſt of little, which Diſcovers whence they proceeded, unleſs they retain ſome ſmall Portion of their reſpective *Oyls*, whoſe Preſence occaſions thoſe Slight *Differences*, which *Diſcriminate*

rate them from each other; and being therefore depriv'd, they Relapſe into their Elementary Simplicity. The ſame happens, as with *Fixed* ſo in *Volatile Salts*, which are *Different* ſo long as they retain any mixture of thoſe *Oyls* and *Sulphurs*, wherewith the Concrete that afforded them was Imbu'd; from which being freed they all *Agree* in one common *Eſſence*.

Although I could confirm this Poſition by a great number and variety of Experiments, I ſhall for the preſent acquieſce in ſome eaſie and Obvious Operations, which will ſufficiently manifeſt, that all *Volatile Salts*, being freed from Adhering *Oyls* and *Sulphurs* become forthwith *Homogeneal* and *Uniform*.

Take any *Volatile Salt*, whether *Vegetable*, *Animal*, or *Mineral*, put it into a very tall *Glaſs-Body*, or *Bolt-head*; Sublime the *Salt* in *Aſhes*, *B. M.* in a *Lamp-furnace*, or with other equal Temperate Heat, and the more Remiſs the better. Repeat this Operation twice or thrice: Moſt of the *Oyl* remains at the bottom, or Adheres to the Sides of the Veſſel employed; and the *Salts* will not eaſily be *Diſtinguiſht* from each other, agreeing in Moſt, if not All, Manifeſt Qualities.

But becauſe this Operation will not ſo well ſucceed, unleſs the Veſſels be very conveniently ſhaped, and the Fire exactly Regulated by a judicious expetienc'd Artiſt; for, either Skill or Due Care being wanting, ſome ſmall Portion of the more Subtile fugitive *Oleaginous* or *Sulphureous* Particles will Aſcend with, and infect the *Salts*, which are thereby ſtill in ſome meaſure (if I may ſo ſpeak) *Specificated*: I ſhall briefly repreſent a more certain and facile method of Reducing them into one common Nature and Denomination. Pour upon the *Volatile Salt*, you would *Purify*, a convenient quantity of well *Rectify'd Spirit* of common *Sea-Salt*. When the *Salt* is Satiated, (which is diſcerned by the ceaſing of the Heat, Ebullition or Commotion,) then with a Gentle equal Heat abſtract the *Phlegme*, and with it ſome ſmall quantity of *Volatile Salt*, which not being cloſely United, is upon the firſt Acceſſion of Heat preſently Diſmiſs'd. *Sublime* the remaining Dry Subſtance, which will become good *Armoniack Salt*. This being *Pulveriſed*, and mixed with equal parts of a pure and well Calcined *Alcalizate Salt*, or if you pour thereon a ſtrong *Lixivium* or *Solution* of any perfect *Alcali*, the *Alcalizate Salt* combining more cloſely with the *Acid* than the *Volatile*, this latter will be Elevated by a ſmall degree of Heat, and appears, either immediately or upon *Rectification*, in the Form of a Dry Subtile Fugitive *Salt*, perfectly free from the Contagion of *Oy's* or *Sulphurs*. And by this Common Method of procedure All *Volatile Salts*, although the Tribes and Concretes that afforded them were exceeding Different and Diſtant, and they alſo *Diſagree in Senſible*, and (as they are commonly ſtiled) *Occult* Qualities, are brought unto a perfect *Agreement* in ſome few common Properties.

I might add, that whatſoever can be Effected by Artificial Operations, in order to the *Unſpecificating* of *Volatile Salts*, is more naturally and ſpeedily performed by the *Air*, which is as I could fully Demonſtrate Impregnated with a *Volatile Salt*, partly *Sublimed* by *Subterraneous* and *Extracted* by *Celeſtial Fires*; partly Expired from *Animals* during their Life; and

both

both from *them* and *Vegetables* upon the Diſſolution or Diſſociation of their Conſtituent parts in *Arefactions* and *Fermentations*. Theſe *Salts*, being receiv'd into the vaſt Subtle Fluid *Expanſe*, are immediately Deveſted of their *Diſcriminating* Properties, and become the Inſtruments of ſundry remarkable Effects and Operations, not only in Natural, but alſo Artificial Productions: Which *Salt* may be obtained by ſundry Methods, and out of ſeveral Subſtances in its Pure *Simplicity*; but being once Diſſolved in Rain, and Dews, and thereby inſinuated into the Earth, or otherwiſe caught and convey'd into *Vegetables*, they are ſoon *Speciated*, and by Union with the other Principles or Corpuſcles of a different Nature, do Degenerate or are Exalted which you pleaſe,) and of *Simple* (at leaſt comparatively) become *Compound* Subſtances; yet eaſily again Reducible, by Nature or Art, into their Primitive *Simplicity*.

It remains that I ſhould detect the ſame *Identity* or Uniformity of Nature and Properties to reſide in all *Highly Rectified Vinous Spirits*, which we have diſcovered in *Salts* both *Fixt* and *Volatile*.

That *Vinous Spirits* are only (or at leaſt chiefly) the more Subtle Fine *Oyls* of *Vegetables*, by *Fermentation* broken into Leſſer Particles, and leſs branched than thoſe which conſtitute the *Oyls* themſelves, will appear highly probable to him that ſhall duly conſider the manner of their Production, and ſeems Demonſtrable by divers obvious Experiments. For the ſame Quantity of *Vegetables*, which being *Diſtilled* with Water, no *Fermentation* preceding, yields *Oyl* plentifully, and little, if any, *Vinous Spirits*; being *Diſtilled* after a convenient time of Digeſtion, and the Addition of ſome proper *Ferment*, they afford ſtore of *Vinous Spirits*; and if fully *Fermented*, there is little appearance of *Oyl*. Alſo the ſame *Herb*, *Fermented* after its *Oyl* is Extricated by the uſual Method, yields a far leſs proportion of *Vinous Spirits*, than when *Fermented* before it was Deprived of its *Oyl*. That portion of the *Oyl*, which is by *Fermentation* divided into leſſer Particles, although, notwithſtanding this Comminution, they are (according to the *Carteſian Hypotheſis*) branched enough to continue Inflammable, yet being Minute, do not affect the Palate after ſuch different manners, or make upon it ſuch a Variety of Impreſſions, as thoſe that are occaſioned by Impulſes from the more groſs *Oleaginous* Particles.

Now, if the Smaller and more Subtile matter, which we ſhall henceforth call *Vinous Spirits*, being Preſſed by Heat, carry up and convey along with them ſome entire unbroken *Oily* parts, or receive them that are capable of being Elevated with the ſame Degree of Heat by which they were Rais'd; theſe mixtures will retain ſomewhat of the moſt remarkable *Differences* in *Taſt*, and ſometimes *Odour*, whereby the *Vegetables* themſelves or their *Oyls* were *Diſcriminated*: But upon long frequent *Digeſtions*, or reiterated *Diſtillations*, theſe groſs *Oleaginous* Particles are either Subdivided, and thereby become *Vinous Spirits*, or that gentle equal Degree of *Heat*, which is ſufficient to Elevate the more active *Volatile Vinous Spirits*, cannot Raiſe the more Sluggiſh *Oyls*; ſo that the Reſults are pure Single *Homogenous Vinous Spirits*, which, whatſoever the *Concretes* were from whence they were derived, though

vaſtly

vaſtly *Differing* from each other, as alſo their *Oyls*, out of which the *Vinous Spirits* were more immediately produc'd; yet the *Spirits* themſelves thus *Purified* are in outward appearance *Similar*, and perhaps as perfectly Simple and *Homogeneous*, as moſt Subſtances in the Univerſe.

What I have delivered, is further confirmed by a more viſible palpable Converſion of *Vegetable Oyls* into *Vinous Spirits*; which I have effected in many, and by Analogous Operations, I preſume, the ſame *Change* may be ſuperinduced upon all. Pour upon an *Ounce* of ſome common *Vegetable Eſſential Oyl* 2 or 3 *Pound* of *Vinous Spirit* perfectly *Dephlegmed*; (the greater quantity the more ſpeedy is the *Tranſmutation* or Change performed;) The Spirit will immediately, upon ſimple Agitation, Abſorbe, Devour, or Diſſolve the *Oyl*, which by long *Digeſtion* or Reiterated *Cohobations* may be totally Deveſted of all thoſe peculiar Properties it enjoyed whilſt an *Oyl*, and become perfectly *Vinous*, never to be *Separated* in a diſtinct Form, or by any known Diacritical Sign or Artifice, to be *Diſcriminated* from what hath, in all appearance, *Converted* or *Tranſmuted* it into its own Nature, or at leaſt into a Subſtance ſo like it ſelf as to deſerve the ſame Denomination.

I ſhall here inſtead of a Concluſion impart unto you *Two* very odd ſurprizing *Experiments*, which have ſome though remote relation, unto the preceding Diſcoveries concerning *Alcalizate* and *Volatile Salts*.

Having procured a great quantity of *Fern-Aſhes*, I *Extracted* their *Salt* after the common Method with *Water*; moſt of the *Water* being Evaporated, I obtain'd ſeveral *Pounds* of *Salt*, the greateſt part whereof being Dryed, I expos'd the Remainder unto the *Air*, that it might Arreſt ſome of the Vapours flitting in the ſame, and thereby become Fluid; which is commonly, though improperly, ſtyl'd the *Oyl per Deliquium*. The reſt of the *Lixivium* which continued Fluid, being *Filtred* whilſt warm, was of a very *Red Colour*, deeper than that of Florid Blood, or of moſt Clarets, and exceeding *Ponderous*. The *Colour* argued it abounding with *Sulphureous* or *Oily* parts, and the *Weight*, that it was highly ſatiated with the *Saline*. Having put this ſtrong Solution into a capacious Glaſs, I either forgot or neglected it five or ſix Weeks; and then looking after it, my Eyes were unexpectedly ſaluted with a moſt pleaſant Spectacle, which having arreſted, did immediately fix, detain and employ them in the Contemplation of an Object, which did at once moſt charmingly invite and fully requite their greateſt Attention: The *Lixivium* had depoſited a large Portion of the *Salt* it formerly contained, part of which Subſided, I ſuppoſe, immediately upon its Cooling: and, ſeveral Weeks of very cold Weather enſuing, did occaſion the precipitation of more. So that, according to my Eſtimation, it was at leaſt 2 Inches thick over the bottom of the Veſſel. The loweſt part of the *Salt* was of a *Dark Colour*, as if ſome Earth, Dirt, or Dregs, were admixt therewith. The upper part or ſurface contiguous to the Liquor was exceeding *White*; and there did ariſe or ſpring out of the whole Maſs of *Salt*, at ſmall diſtance from each other, ſeveral, I believe 40, Branches, which (abating the Colour) did moſt exactly reſemble that ſort of *Fern* which is ſingle like *Polypody*, and not Branched, ſending out ſeveral Leaves on each ſide from one

Stem. Their *Magnitudes* were divers, but the *Figures* of all were the ſame, without the leaſt Variation; only ſome emitted more Leaves from the Stem than others; which is alſo uſual in the *Natural Fern.* I preſerved theſe *Artificial*, regenerated or reſuſcitated *Vegetables* many Weeks in the ſame Poſition, not moving them, they being of ſo tender a Fabrick, that the leaſt Motion of the Glaſs did hazard their Diſappearance.

Obſ. 1. The *Fern* was of a middle Conſtitution between *green* and *dry* when Burnt.

2. It was employed to Dry Malt, burnt in a Kiln with a cloſe ſmothering Heat.

3. Therefore the *Aſhes* yielded a far greater Proportion of *Salt*, than when the *Herb* is very *Dry*, and *Incinerated* by a free open *Fire.*

4. From the ſame Cauſes the *Salt* was not perfectly *Alcalizate*, but plainly *Tartareous*, and abounded with *Oyl* and *Acid* Particles; and therefore might properly enough be call'd an *Eſſential Salt*: And upon *Fuſion* with a ſtrong Fire was much chang'd, from a *Dark Brown* becoming *White*, and was by the Action of the Fire much leſſened in bulk, the conſequence of the Avolation of *Oyl*, *Acidities*, and perhaps other Subſtances, during the Operation of ſo ſtrong a Fire.

5. That part of the *Impure Salt*, which, as I before intimated, was Set to *Deliquate*, did not, as is uſual, become *Liquid*, but a perfect Gelly, which could not by any method be afterwards reduced unto its *Saline* Form; which recalls unto my mind what is delivered by *Kircher* of his own perſonal Experience in the *Reſuſcitation* of *Plants*, who affirms, That at ſome certain time of the Operation, the prepared *Vegetable* Subſtances appear in ſuch a form.

The *other Experiment* concerning *Volatile Salts* ſucceeded after this manner;

Having occaſion for *Volatile Urinous Spirits* for ſome ordinary Uſes, I mixt equal parts of *Sal Armoniack* and *Pot-Aſhes*, which latter had a very ſtrong *Sulphureous* Smell, yet did ſeem to abound with *Salt*, and that conſiderably *Alcalized.* The mixture being put into a Tall *Glaſs-body*, immediately upon its feeling the Heat, plenty of *Volatile Salt* Sublimed; from which I expected no unuſual appearance, having often repeated this Operation without obſerving any Circumſtance which deſerved peculiar Attention. Being called from my *Laboratory* juſt as the *Salt* began to appear, at my Return I was amaz'd to ſee in the *Glaſs-head*, which was, as the *Cucurbit*, very Spacious or Capacious, a *Foreſt* in *Perſpective*, ſo admirably Delineated, as not to be excell'd, if imitated, by the Pencils of the greateſt Maſters in *Painting.* They were all, not only to my Apprehenſion, but alſo in the Opinion of ſeveral Spectators, ready to atteſt it, *Shadows*, *Rudiments*, *Adumbrations*, or *Repreſentations* of *Firrs*, *Pines*, and another ſort of *Tree* which I cannot eaſily Deſcribe, nor have I ever ſeen it growing Wild or in Gardens, or in any Herbal exactly Repreſented. All theſe *Images*, although very numerous, were reducible to one of theſe *three Species.* I do not remember, that I have ever ſeen any more tranſportingly

Agreeable

Agreeable Appearance in any Chymical Operation; although it is well known that *Chymiſtry* doth daily preſent thoſe, who are very converſant with her, a great Number and Variety of Objects, highly diverting for their Prettineſs and Curioſity in *Colour*, *Figure*, and other Accidents.

But to return unto the foremention'd Operation, I am not ignorant, that *Volatile Salts* do conſtantly ſhoot into variouſly and beautifully Shaped *Cryſtals*, but I could never obſerve them Regular, or Reducible unto a Certain number of Figures; whereas in the Operation we have deſcribed, the Figures were *firſt* very different from any that ever appeared before or ſince upon *Diſtillation* of the Commixture, and *Diſtillation* of *Pot-Aſhes* and *Salt Armoniack*, although by me frequently Repeated; as neither upon the *Diſtillation* or *Rectification* of *Hartshorn*, *Blood*, *Urine*, *Cranium Humanum*, *Salt Armoniack* with *Lime*, *Salt* of *Tartar*, and other *Alcalies*. *Secondly*, The Figures were all Reducible, in the Apprehenſion of every Spectator, unto *three* Kinds; two of them commonly known. But of this ſo Delicious a Spectacle, to my great Grief, I was ſoon deprived by the *Sublimation* of more *Salt*, which filling up the Interſtices did together with the former, caſe the Glaſs, and retain'd no other Figure than the Concavity thereof allowed of.

The next Day, that great Virtuoſo Sir *Rob. Murray*, (whoſe Memory can never be too much cheriſhed, nor his loſs ſufficiently bewailed,) honouring me with a Viſit, I acquainted him with the lately recited Accident; who ſcrupled not, though a Rigid Philoſopher, to credit my Relation, and to confirm me in the belief, that ſome certain Governing Principle might contribute towards the production of this Phænomenon,

He affirm'd, that one *Daviſon*, a famous and experienced *Chymiſt* at *Paris*, had frequently ſhewed him in a Glaſs a great Company of *Firrs* and *Pines*, which ſeemed no leſs Lively and Accurate, than thoſe produc'd by *Painters* are; but ſuch ſuſpicions were ſoon ſtiffled by their ſpeedy diſappearance and eaſy Reproduction. He alſo referred me unto his Book of *Chymical Operations*, where I find he makes mention of it, as a great Artifice, as really it was, and makes it no leſs a Myſtery by concealing the Proceſs or Materials, whereby it may be effected; only that nothing was employed beſides Subſtances afforded by the *Trees* which were Repreſented; and that the chief Ingredient was *Turpentine*. Herein his Operation differed from that which I lately recited; in that the Subſtance, out of which *He* rais'd thoſe Shapes, was of a more Fixed Nature; that which afforded *Mine*, *Volatile* to the higheſt degree: *He* could conſtantly and regularly produce theſe Figures; but *Mine* did unexpectedly and fortuitouſly repreſent themſelves unto my View; neither do I ever again expect the like Appearance. Nor will I contend with him, that ſhall affirm, it was a mere Phantaſme, or a *Fortuitous Coalition* of *Salts* into ſuch pretty *Figures*.

IX. 1. *Burn* any ſort of *Herb*, *Flower*, *Fruit*, *Wood*, or whatever it be, and make *Aſhes* thereof, with the *Aſhes* and with pure *Water* in its natural Temper make the *Lye*, which after ſtrain through moiſt Paper or a Filtre, ſo

Vegetable *Salts Extracted*; *by S. Fr. Redi n.* 243. *p.* 281.

ſo that it becomes as Clear as poſſible. Afterward put the *Lye* into a Glaſs Veſſel, and let it remain in *Balneo Mariæ* until ſuch time as a great part of it *Evaporates*, according to the Proportion obſerved by thoſe that are uſed to ſuch Operations, and according as the *Congelation* of the *Salt* is deſired to be more or leſs Expedited or Retarded.

2. If you keep the *Lye* to *Evaporate* by the *Fire* in Veſſels of *Earth* Glaz'd, you will loſe a great Quantity of the *Salts*, for that as the *Lye* grows thicker, the *Salt* penetrates the Bottom and Sides of the Veſſel of *Earth*, and is loſt.

3. The Quantity of Water to make the *Lye* of is not determin'd; for the moſt part 5 ℔. of *Water* will Extract all the *Salt* from 2 ℔. of *Aſhes*.

4. The *Aſhes*, whereof we have already made the *Lye*, and by Conſequence drawn out the *Salt*, may, if you *Burn* the ſame again in a Brick Furnace, make you afterwards another new *Lye*, which uſually yields ſome ſmall Portion of *Salt*.

5. The *Salts* drawn in the manner aforeſaid, when the *Air* is Moiſt uſe to *Melt*, to obviate this Inconvenience, when you burn the Materials to reduce them to *Aſhes*, 'tis requiſite to uſe with them a due quantity of *Sulphur*: and if it happen the *Aſhes* ſhould be made to your Hand, you may mingle them with *Sulphur*, and keep the ſame to the Fire till ſuch time as it be *burnt*. By this means the *Salt* will never come to *Run*, but become more *White* and *Chryſtalline*.

6. There is no General Rule concerning the Quantity of *Sulphur* to be put into the Materials you thus *Burn*; you may nevertheleſs at a gueſs ſay, to 100 ℔ of Materials 4 or 5 ℥ of *Sulphur* are uſually ſufficient.

7. All the *Salts* have a peculiar and *Determined Figure*, the which they always keep, although they are often Reſolved into Water and afterward Congealed.

8. If in one only Liquid you Diſſolve together 2 or 3 ſorts of *Salts* of *Different Figure*, when they Congeal they all aſſume their ancient and *Proper Figure*, and this not only happens in *Factitious*, but alſo in *Mineral Salts*. If in a Veſſel full of Water you *Diſſolve* equal or unequal Quantities of *Vitriol* of *Cyprus*, *Roch Allum*, and of Purify'd *Nitre*, this Water will be all of an *Azure Colour*: But when the Water is *Evaported*, you will ſee in the Veſſel, that the *Vitriol*, the *Allum* and the *Nitre* have re-aſſum'd diſtinctly their firſt *Natural Figures*, and that the *Vitriol* hath recovered its moſt compleat *Azure Colour*, leaving the *Nitre* and the *Allum* with their uſual Tranſparent *Whiteneſs*.

9. Although it be ſaid before, (N. 7.) That all the *Salts* have a *Proper* and *Particular Figure*, yet notwithſtanding all this, I have obſerved, That ſome manner of *Salts* have 2, 3 and 4 ſorts of *Figures*. *Two ſorts* have been ſeen in *Lettuce*, in the *Scorzonera's*, in the *Musk Melon*, the *Scopa*, in the *Roots* of *Eſula*, in the *Black Hellebore*, in *Endive*, in *Eye-bright*, in *Wormwood*, in *Sorrel*, and in *Shoots* of *Vines*; *Three ſorts* in *Black Pepper*, and in *Incarnate Roſes*; *Four Sorts* in the *Roots* of *White Hellebore*.

10. Beſides

10. Beſides the before-mention'd *Diverſity* of *Figures* which are found in *Salts*, I have obſerved, that among all *Salts* of whatſoever *Figure*, there are found ſome *Cubical*; which, though they be never ſo often Diſſolved and Congealed, appear ſtill of a *Cubical Figure*, or inclining to it.

S. *Redi* knows not that it is a General Rule, that the Different Parts of *Herbs*, *Fruits*, &c. make *Diverſity* in the *Figure* of their *Salts*; but he ſays particularly, That the *Salt* of the *Leaves* of *Lawrel* Differ from that of the *Wood*, and that the *Figure* of the *Salt* of the *Pulp* of a *Gourd* differs from that of the *Rind*.

12. Many *Salts* of different Matter have the *ſame Figure*, or at leaſt very like. The *Salt* of *Cucumber* hath a *Figure* like the *Salt* of *Eye-bright*, *Mechoacan*, *Scopa*, and *Lettuce*; alſo the *Salt* of *Orange-Flowers*, *Roſes*, *Ginger*, *Endive*, *Colloquintida*, *Scorzonera-Root*, *White-Hellebore Roots* and *Liquoriſh* are all like one another; *Coleworts* and *Roſemary Flowers*, give a *Salt* of one and the *ſame Figure*, as likewiſe do among themſelves *Vine-Branches*, *Sorrel*, *Black-Pepper*, the *Rind* of *Pomegranates*, and the *Roots* of *Black Hellebore*.

13. To make the Bodies of the *Salts*, when they Congeal, reſt *Diſtinct* one from another (ſo as their *Figures* may be obſerved) and not to be Entangled and Heaped together, 'tis neceſſary, he ſays, that very great Diligence be uſed in Evaporating the *Lye*: For if that be wholly Evaporated, or if too great a part thereof, the *Salts* make a Confus'd Cruſt at the Bottom of the Veſſel; if the *Lyes* are leſt too Weak, the *Salts* require a very long time to Congeal in; 'tis requiſite therefore to uſe ſuch a Diligence, which is not to be gain'd without long practice. The Inſtruments for meaſuring the *Weights* of *Liquids*, may give a Rule, which if it be not General, will at leaſt come very near it. The *Lyes* being reduced to a convenient Thickneſs, are put into little ſmall Glaſſes cloſed with a ſtopple and kept in a dry ſhady Place, and you muſt expect by the Benefit of Time, that the *Salts* will Congeal themſelves into *Chryſtalline Stones*, either in the Bottom or on the Sides of the Veſſel.

14. Not all *Herbs*, nor *Flowers*, nor *Fruits*, nor *Woods*, when they are *burnt*, render equally the ſame Quantity of *Salt*, but according to the Diverſity of their Species, the Quantity of *Salt* which is drawn from their *Aſhes*, is found Different. The Seaſons wherein the *Plants* are gathered make a great Diverſity; as alſo does the Country, whether Mountainous, or Champaine, or Sea-Coaſt, or Marſhy, or Moiſt.

15. All Matters *Burnt* give not the ſame Quantity of *Aſhes*. But there is a great Diverſity which you may ſee by the following *Proofs*; the greateſt part in the *Year* 1660.

Vegetables.		*Aſhes.*	*Salts.*	*Aſhes* from 100 ℔ of *Vegetables.*	*Salts* from 1 ℔ of *Aſhes.*
	℔.	℔. ℥ ʒ	℥ ʒ	℔ ℥ ʒ ℈ gr.	℥ ʒ ℈ gr.
Dryed *Flowers* of *Oranges*	100	4 6 0	0 5	4 6 0 0 0	0 1 0 8
Gourds new gathered (which dryed in the Oven were 36 ℔)	800	4 0 0	10 0	0 6 0 0 0	2 4 0 0
Red Onions (being 720) Roaſted, the Coals burned to 16 ℔; to the Coals were added 4 ℥ of *Sulphur*	400	1 6 0	2 2	0 4 4 0 0	0 7 1 0
Eye bright, freſh, and afterwards ſtilled and Burnt	150	5 0 0	4 0	3 4 0 0 0	1 1 1 9
Diſtilled *Roſes*	120	4 0 1		3 4 0 0 0	3 0 0 0
Maidenhair	100	9 0 0	0 4	9 0 0 0 0	0 0 1 8
Roots of *Black Hellebore*, which Dryed came to 50 ℔	150	6 0 0	1 0	4 0 0 0 0	0 0 4 0
Roots of *White Hellebore* freſh, which dryed came to 50 ℔.	150	2 0 0	4 0	1 4 0 0 0	1 0 0 0
Roots dryed and burnt of freſh *Eſula*	96	3 0 0	2 0	3 1 4 0 0	
Roots of *Liquoriſh*	30	2 0 0	1 4	6 8 0 0 0	0 6 0 0
Pellitory	20	1 0 0	0 6	5 0 0 0 0	0 6 0 0
Green Endive	10	2 0 0	2 0	2 0 0 0 0	1 0 0 0
Green Bindweed	90	1 0 0	2 0	1 1 2 2 0	2 0 0 0
Leaves of *Lawrel*	2000	33 0 4	0 0	1 2 0 0 0	0 3 1 22
Leaves of *Lawrel*	500	6 0 0	10 0	1 7 4 2 10	1 5 1 6
Water Melons well ripe, the *Seeds* being taken.	1000	25 0 1	9 0	2 6 0 0 0	0 6 1 11
Cucumbers	2400	18 0 0	0 0	0 9 0 0 0	
Wood of *Ivy*	300	9 0 0	0 0	3 0 0 0 0	
Scorzonera dryed	50	8 0 0	0 0	16 0 0 0 0	
Pine Apples, the *Nuts* taken out	300	3 0 0	0 0	1 0 0 0 0	
Mugwort dryed	150	8 0 0	0 0	5 4 0 0 0	
Leaves of *Cyprus*	130	6 0 0	0 0	4 7 3 5 0	
Peele of *Pomegranates* dryed	10	1 8 0	0 0	6 8 0 0 0	
Saſſafras	2	1 0 0	0 0	3 1 4 0 0	
Lignum Sanctum	12	2 6 0	0 0	20 10 0 0 0	
Yellow Sanders	4	1 1 4	0 0	1 0 4 0 0	
Black Pepper	4	1 2 4	0 0	5 2 4 0 0	
Ginger	30	1 7 0	0 0	5 3 2 2 0	
Turbith	12	1 0 0	0 0	8 4 0 0 0	
Wood of *Fir*		3 0 0	3 0		1 0 0 0
Scopæ		16 0 1	4 0		1 0 0 0
Scopæ		16 0 1	6 0		1 1 0 0
Wheat Flower				2 2 5 1 0	

Heads of Old *Garlick* 32 ℔. were Dryed in a Furnace and *Burnt*; from the *Aſhes* there was hardly any *Salt* to be gathered.

Thirty Pounds of *Wheat Flower burnt* in a *Furnace* with a little *Sulphur*, and *burnt* a-new in a Potter's Oven, gave 8 ℥ of very black *Aſhes*, the which being baked again for 8 Days continually in a Brick Furnace after the *Lye* was made, there could not be a *Grain* of *Salt* Drawn. The like happen'd in 10 ℥ of *Aſhes* Drawn from a *Stare* and a *half* of Bran, *burnt* firſt in the Furnace with *Sulphur*, and afterwards baked in a Potter's Oven, and in one of Bricks.

16. All the *Salts* whatever Drawn from the *Aſhes* of *Vegetables*, taken by the Mouth, ſays he, have a *Purging* Faculty, and a great meaſure more than what by ſome is believed in *Common Salt*, which taken by the Mouth has little or none at all; or if it have any, betwixt that of *Common Salt* and *Vegetables*, the Proportion is but as *Two* to *Eight*.

17, This *Solutive* Faculty is of equal Energy in all the *Salts*, in ſuch manner that the *Salt* of *Sumack*, *Peels* of *Pomegranates*, *Myrtle Berries*, or *Maſtick*, *Purges* as much as the *Salt* of *Rhubarb*, *Sena*, *Turbith*, *Mechoacan*, and all other like *Purgative Drugs*.

18. The *Doſe* to be uſed is the ſame in all the *Salts*, to wit, from 2 *Drachms* and a *half* to *half* an *Ounce*, Diſſolved in 6 *Ounces* of Common Water and Broth; he has obſerved by infinite Experiments, that *half* an *Ounce* uſes to *Purge* 3 ℔. and a *half*, or 4 or thereabouts of Matter, more or leſs, according to the Complexions, and according to the Fulneſs of the Bodies.

19. In the *Purging* he has found no *Difference* betwixt theſe *Salts* that have ſharp Points, and thoſe that are Obtuſe and Blunt or *Cubical*; he has made proof very often in divers Perſons, cauſing the like *Cubical Stones* of *Cucumbers*, *Ginger*, *Colewort*, and of *Liquoriſh*, to be picked out, and he has ſene that they have *Worked* with the ſame Energy as the moſt Acute *Hexagone Stones* of the *Salt* of *Pepper*, of *Carnation Roſes*, of *Mechoacan*, of *Coleworts*, of *Cucumbers*, &c.

20. From the aforeſaid Obſervations, though you cannot Eſtabliſh a certain Rule, you may nevertheleſs Conjecture, not without ſome Reaſon, *Firſt*, that the *Salts* drawn from the *Aſhes* of *Herbs*, *Flowers* and of *Fruits*, &c. do not Conſerve the Virtue, and that Faculty which Phyſicians believe the *Herbs*, *Flowers*, *Fruits*, &c. Endowed with; *Secondly*, You may very near be certain of the Proportion of *Aſhes* riſing from each Species of *Vegetables*, and of the Quantity of *Salt* which is afterwards to be Drawn from them.

21. You may alſo obſerve that ſome *Vegetables* Inſipid and Cold, as *Endive*, *Pompion*, and *Roſes*, have given much more *Salt* than others of a ſtronger Savour, Aperitive, and Inciſive, as the *Onions*, *Hellebore*, *Lawrel*, *Maiden-Hair*; and *Garlick*, which is ſo ſtrong, gives none at all: But it may perchance be ſaid, that in theſe there is a greater Quantity of *Volatile Salt*.

X. M.

To find the Exact Quantity *of* Volatile Acid Salts *contain'd in* Acid Spirits; *by M.* Homberg. *n.* 262. *p.* 532.

X. M. *Homberg*, in a Diſcourſe at a Meeting of the *Royal Academy* concerning the *Quantity* of *Volatile Acid Salts* contained in *Acid Liquors*, told us, That the *Acid Spirits* were no other thing but a *Salt* Diſſolved by a little Water, which the Taſt ſhews well enough for an *Acid*, as alſo its effects. He calls it *Volatile*, becauſe it is Raiſed by the Fire with the *Phlegme*, and it cannot be but hardly Separated from that, and Reduced in a Dry form: That nevertheleſs M. *Homberg* has made in the Operation inſerted in the *Memoirs* of the *R. Academy*, publiſh'd the 15*th.* of *Dec.* 1692. by what Operation it appears that the *Acid Spirits* are nothing but *Volatile Salt* and *Phlegme*. The *Quantity* of *Salt* contain'd in a determined Quantity of *Acid Spirit* was not yet known, but he has given a way to know it, and alſo he may ſay the *Quantity* of *Salt* contain'd in whatever *Acid Spirit*, only by the *Weight* of *Volume* compared with the *Weight* of another *Spirit*, of which the *Quantity* of *Salt* contain'd in it was known; *Firſt*, for knowing the *Quantity* of *Volatile Acid Salt* contained in ſome *Acid Spirits*, he has pour'd upon an *Ounce* of *Salt* of *Tartar* well dryed, the *Quantity* of one *Acid Spirit*, as much as the *Salt* of *Tartar* has been able to take of it, then he Evaporated all the Inſipid Humidity of *Phlegma* out of this *Salt*, and he *Weighed* the matter, the *Quantity* of his *Weight* above the *Weight* of the *Salt* of *Tartar* before *Saturation* is the *Quantity* of *Acid Volatile Salt* contained in the *Quantity* of *Acid Spirit* which has been taken by one *Ounce* of *Salt* of *Tartar*. Here is the Table of the *Quantity* of *Acid* that has been neceſſary to the perfect Impregnation and Fulneſs of the *Salt* of *Tartar*, and by the ſame means the Table of the *Quantity* of *Acid Volatile Salt*, contain'd in one *Ounce* of ſeveral *Acid Spirits*.

Vid. Vol I. *Cap.* VI. *Sect.* VI. 2. & 3. VI.

For the perfect Impregnation of one *Ounce* of *Salt* of *Tartar*, was poured upon it *Spirit* of *Nitre* ℥*j*. ʒij. *Gr. xxxvj*. the *Weight* of that *Salt* after the Evaporation of the Inſipid Humidity has been Increaſed to ʒ*iij*. *Gr. x*. above *one Ounce*; that Increaſe coming from the *Acid* retained in the *Salt* of *Tartar*, ſhews to us that *one Ounce* of *Spirit* of *Nitre* contains ʒ*ij*. *Gr. xviij*. of *Acid Salt*.

So for the Impregnation of ℥*j*. of *Salt* of *Tartar*, has been poured upon it *Spirit* of *Salt* ℥*ij*. ʒ*v*. the Increaſe after the Evaporation has been found ʒiij. *Gr.* xiv. and therefore *one Ounce* of *Spirit* of *Salt* contains ʒj. *Gr. xv* of *Acid Salt*.

Upon ℥j. of *Salt* of *Tartar* has been poured *Oyl* of *Vitriol* ʒv. the Increaſe has been found ʒiij. *Gr.* v. therefore ℥j. of *Oyl* of *Vitriol* contains ʒiij. *Gr.* lxv. of *Acid Salt*.

Upon ℥j. of *Salt* of *Tartar* has been pour'd *Aquafortis* ℥j. ʒij. *Gr.* xxx. the Increaſe has been found of ℥iij. *Gr* vj. therefore ℥j. of *Aquafortis* contains ʒij. *Gr.* xxvj. of *Acid Salt*.

Upon ℥j. of *Salt* of *Tartar* has been poured *Diſtilled Vinegar* ℥xiiij. the Increaſe has been found of ʒiij. *Gr.* xxxvj. therefore ℥j. of *Diſtilled Vinegar* contains Gr. xviij. of *Acid Salt*.

It

It appears by this *Table*, that the *Quantity* of *Acid Salt* for Saturating the *Salt* of *Tartar* is near the ſame, though the *Quantity* of *Acid Liquors* ſhould be very different; 'tis only the *Acid* of *Vinegar* of which the *Salt* of *Tartar* retains more than it does of the others, that M. *Homberg* attributes to the Subtility of the Particles of the *Vegetable Acid*, which have been very much divided by the alterations in the *Fermentation* of the Liquors in the *Plants*, &c. of the *Wine*, and alſo in the *Diſtillation*, which Alterations the *Mineral Acid* has not received. The *Vegetable Acid* by that Subtility of Particles is able to Impregnate a greater Quantity of Liquor, than the ſame Quantity of *Mineral Acid*, and by that it is more eaſily raiſed up by the Fire than the others.

By theſe Obſervations, M. *Homberg* makes evident the reaſon of ſome Caſes difficult to be explain'd without them: As 'tis well known *one Ounce* of *Aqua Regia*, compounded with the *Spirit* of *Nitre*, and the *Armoniack Salt*, Diſſolves *twice* more *Gold* than *one Ounce* of the *Spirit* of *Salt* can do. The *Chymiſts* attribute that Effect to the Softneſs of the Points of one *Acid*, and to the Hardneſs of the other: When theſe Obſervations make Evident, that the *Spirit* of *Nitre* contains *twice* more of *Acid Salt* than the like *Volume* of *Spirit* of *Salt*, and open in the ſame time the true Cauſe of this Effect.

M. *Homberg* Diſcours'd alſo how we may know the *Quantity* of *Acid Salt* contain'd in an *Acid Spirit*; which he doth in the following manner: He takes an *Acid Spirit* (as *Spirit* of *Nitre*) he *Weighs* it by his *Areometer*, and at the ſame time he *Weighs* alſo *Diſtilled Water* (for the *Weight* of the *Phlegm* contain'd in the *Acid Spirits* is like as the *Weight* of the *Diſtilled Water*;) then he looks for the *Bulk* of *Spirit* of *Nitre*, compar'd with a like *Bulk* of *Diſtilled Water*, which has given a certain Quantity of *Acid Salt* for each *Ounce*; and from thence he concludes, that the *Bulk* of the other *Spirit* of *Nitre*, of which the *Weight* is known, compared with the like *Bulk* of *Water*, ſhall give a Determined *Quantity* of *Acid Salt*, which will be Raiſed by the computations of the Relations of the *Weights* of thoſe *Spirits*, with the *Weights* of the like *Bulks* of *Diſtilled Water*, by concluding from them and from the *known Product* of *Acid Salt* for the *unknown Product* of the ſame.

XI. I have received Accounts of 4 Sorts of *Factitious Shining Subſtances*. 1*ſt*, A *Factitious Paſte* of Dr. *Baldwin*, ſhining in the dark like a Glowing Coal, after it hath been a while expos'd to the *Day* or *Candle-Light*. Another is the *Bononian Stone* Calcin'd, which Imbibes Light from the *Sun-Beams*, and ſo renders it again in the dark, whereas the former needs no ſhining Sun, but doth the effect in quite over-caſt Weather, and even in a Miſty Day. The 3*d*, is by the *Germans* call'd *Phoſphorus Smaragdinus*, ſaid to be of this Nature, that it collects its Light not ſo much from the *Sun-Beams*, or the Illuminated Air, as from the *Fire* it ſelf; ſeeing that, if ſome of it be laid on a Silver or Copper-plate, under which are put ſome live Coals, or a lighted Taper, it will preſently Shine, and if the ſame Matter be ſhaped into Letters, one is able to read it. The 4*th*, is call'd *Phoſpho-*

Four ſorts of Factitious Shining Subſtances; *by Mr.* Oldenburg. *n.* 135. *p.* 867.

rus Fulgurans which is a Matter made both in a Liquid and Dry Form: and not only ſhineth in the Dark, and communicates a ſudden Light to ſuch Bodies as 'tis rubbed upon, but being included in a Glaſs-Veſſel well cloſed, doth now and then *Fulgurate*, and ſometimes alſo raiſe it ſelf as 'twere into waves of Light; Differing very much from the *Baldwinian* Stone, which is to be expos'd to ſome Shining Body, as the *Day*, the *Sun*, the *Fire* or ſome *Lighted Candle* to receive Light from thence, whereas this *Fulgurating* Subſtance carries its Light always with it, and when put in a dark place, preſently ſhews the ſame. Of which we have this further aſſurance given us, that a little portion of it having been kept 2 whole Years, hath not yet loſt its power of *Shining*: So that 'tis believed, if a conſiderably big piece were prepared for it, it would ſerve for a *Perpetual*, or at leaſt a very *long-laſting Light*.

The Bononian Phoſphore *loſt*; by.....*n.* 21. *p.* 375.

XII. 1. Though ſeveral Perſons have pretended to know the Art of Preparing and Calcining the *Bononian Stone*, for keeping a while the Light once Imbibed; yet there hath been indeed but One, who had the true Secret of performing it. This was an *Eccleſiaſtick*, who is now dead, without having left that Skill of his to any one.

Statues *of the* Bononian Stone; *n.* 134. *p.* 842.

2. S. *Malpighi* takes notice, That one *S. Zagonius* had a way of making out of the *Bononian-Stone* Calcin'd, *Statues* and *Pictures* variouſly *Shining* in the *Dark*. But he adds (to our ſorrow) that that Perſon lately Dy'd, without diſcovering to any Body his Method of Preparing it.

A Phoſphorus; by *Mr.* Robert Boyle. *n.* 196. *p.* 583.

XIII. *Septemb.* 30. 1680. There was taken a conſiderable quantity of *Man's Urine*, (becauſe the Liquor yields but a ſmall Proportion of the deſired Quinteſcence) and of this a good part at leaſt had been for a pretty while Digeſted before it was uſed. Then this Liquor was *Diſtilled* with a Moderate Heat, till the *Spirituous* and *Saline* parts were Drawn off; after which the Superfluous Moiſture alſo was abſtracted (or Evaporated away) till the remaining Subſtance was brought to the Conſiſtence of a ſomewhat thick Syrup, or a thin Extract. This done, it was well Incorporated with thrice its weight of fine *White Sand*; and the Mixture being put into a ſtrong *Stone Retort*, to which a large *Receiver* (in good part fill'd with *Water*) was ſo joyn'd, that the Noſe of the *Retort* did almoſt touch the *Water*. Then the two Veſſels being carefully Luted together, a Naked Fire was gradually adminiſtred for 5 or 6 Hours, that all that was either *Phlegmatick* or *Volatile* might Come over firſt. When this was done, the Fire was Increaſed, and at length for 5 or 6 Hours made as Strong and Intenſe as the *Furnace* (which was not bad) was capable of giving; (which *Violence* of *Fire* is a Circumſtance not to be Omitted in this Operation.) By this means there Came over good ſtore of *White Fumes*, almoſt like thoſe which appear in the *Diſtillation* of the *Oyl* of *Vitriol*; and when thoſe *Fumes* were paſs'd, and the *Receiver* grew clear, they were after a while ſucceeded by another ſort, that ſeem'd in the *Receiver* to give a faint blewiſh *Light*, almoſt like that of little burning Matches dipt in *Sulphur*. And laſt of all, the *Fire* being

ing very *Vehement*, there paſs'd over another Subſtance, that was judged more *Ponderous* than the former, becauſe it fell through the *Water* to the bottom of the *Receiver*; whence being taken out, (and partly even while it ſtay'd there,) it appear'd by ſeveral Effects, and other *Phænomena*, to be ſuch a kind of Subſtance as we deſired and expected.

An Account of Dr. Kunkel's Phoſphores; *by* Joh. Chr. Sturmius. *Ph. Col. n.* 2. *p.* 9.

XIV Dr. *Kunkelius* Prepares out of the *Condenſed Light* (which by his Skill in *Chymiſtry* he knows to Extract out of any kind of Terreſtrial Body whatſoever, as if it were there naturally placed) certain *Pills* about the bigneſs of Peas (to which he aſcribes very ſtrange Comforting and *Medicinal* Vertues) theſe being moiſtened a little, and in the *Dark* ſcraped with ones Nail, Knife or the like, do yield a very conſiderable *Light*, not without a conſpicuous *Smoak* alſo; which afford a *Light* yet much more Pleaſant and Strange, if about 8 or 10 of them be put into a Glaſs of Water, and therewith ſhook in the *Dark*, for thereby all the Water and the Cavity of the Glaſs will ſeem perfectly Filled with Light, Flaſhing by Turns very briskly; As I my ſelf, not without the Admiration of the Spectators, have ſeveral times Experimented. The ſame Dr. *Kunkelius* hath alſo reduced the ſame *Lucid* Matter into the form of larger *Stones*, (which I have not yet had the good Fortune to ſee my ſelf) which being *Warmed* by the *Hand*, but eſpecially if they be a little Scraped, or Rubbed upon a Paper or Table, deſcribe Letters very Legible in the *Dark*.

Experiments with the Liquid *and* Solid Phoſphorus; *by Dr.* Fred. Slare. *Ph. Col. n.* 3. *p.* 48.

XV. 1. The *Liquid* and *Solid Phoſphorus* do not materially Differ, being made both out of Subſtances taken from a Humane Body. The *Liquid* is a Subſtance mixed with a Liquor, that (though it would burn a body when in a *Solid* Maſs) will not Offend a Lady's Hand with Scalding or even Heat, when Waſhed in it. An Experiment of this kind I made this laſt Week, in the Preſence of ſeveral Perſons of very great Quality, where a very Learned and Ingenious Perſon, Waſhing both his Hands and Face with it, made not only his own Face to *Shine*, but the Luſtre of his Face diſcovered 3 or 4 other Faces not far diſtant: yet ſo ſoon as the Candles were brought into the Room, the *Shining* diſappeared, and no Sign or Change was perceivable on the Skin of either.

This *Phoſphorus* continues not it's *Light* very long, if cloſe ſtopt; yet in one ſort I have obſerved a kind of *Flaſhing* 6 or 7 times ſucceſſively, though the Glaſs were cloſe ſtopped; which makes me to conclude it to be the ſame with the *Phoſphorus Fulgurans* of Dr. *Elſholt*, the *Flaſhings* of it having ſome reſemblance to *Lightning*.

The other *Phoſphorus* which is *Solid*, Differs not, as I ſaid, materially from the *Fluid*, being made for the moſt part out of *Urine*: but I am ſufficiently ſatisfied that it may be as well made out of *Blood*, if it could as eaſily be obtained as *Urine* in great quantities, ſince *Urine* is but the *Serum* of *Blood* ſtrained through the *Kidneys*.

In this Preparation, we have not only the common *Analyſis* into *Waters*, *Spirits*, *Volatile Salts*, *Sulphurs*, or *Oyls*, but divers other extraordinary appearances before this Grand Product comes.

The Subſtance of this *Phoſphorus* may be made as *Tranſparent* as any Reſinous Body, and will *Melt* like Wax in warm Water: And when cold it is exceeding Tough, and cuts like *Luna Cornea*, or rather ſomewhat harder. When 'tis all under or covered with *Water*, it *Ceaſes* to *ſhine*; but whenever any part of it chances to Emerge or get into the *Air*, though the Glaſs be Hermetically ſealed or perfectly ſhut, yet it will *ſhine*.

In a large Glaſs I have kept it without Water for ſeveral Days, and yet continually *Shining* with little or no Diminution of its *Light* or *Weight*.

Of this *Solid* I have had ſome parcels much more Vigorous and Inflammable than others. When I made ſome Experiments laſt Summer with this *Solid Phoſphorus*, every one handled it without any Danger: But I have ſince had ſome Parcels that would ſcarce endure the touch of a Warm Hand, without taking *Fire* and *Burning*. Such miſchances have happened to ſeveral, that extorted this Curioſity out of my Hands, who would not believe ſuch a Cold Body, would of it ſelf turn into ſo Fierce a *Fire*. Thus making ſome Experiments in the Company of a very worthy and ingenious Gentleman, I laid down a piece of this *Luminous* Subſtance (about 2 *Drachms* in weight) and it took *Fire* when no Candle was in the Room, and we were all at a good diſtance, and it Blazed like a Faggot, and Burnt the Carpet and Board it lay upon. This ſort is only for the Experienced and Careful to meddle with.

The leſs vigorous, as I was ſpeaking of, did afford us this Experiment; We writ with a Pointed end, what Words we pleaſed in the *Light*, and then we removed into the *Dark*, and had very Radiant and *Legible* Characters, which looked like Words written with a Beam of *Light*: I have made this continue ſo for a conſiderable time, by laying it on with Advantage.

If we carry theſe Glorious Letters to the *Fire*-ſide, and ſuffer them there to grow Warm, they will preſently turn into *Dark Lines*, and remain as long as good Ink may be thought to do.

This *Light* is very diffuſive of it ſelf, for I have marked down above a 100 Characters with this Illuſtrious Pencil, and found not a 20th part Conſumed.

In like manner I weighed out half a *Grain*, and I ſpread it over my Hand at Night, which it gilded all over, and continu'd *Light* all the Night, for ſo I found it next Morning.

As a further Proof of its Diffuſive Quality, having Weighed out one *Grain*, and counterpoiſed it in good Scales, it continued to *Flame* in the open Air for 7 or 8 Days, inſomuch that ſhutting my Study Windows by Day, I could always ſee a Bead of *Fire*, and when I looked intent upon it, it ſent up a *White Flame* into the Ambient Air; which a large piece does very remarkably.

After all was Burnt out, we had no *Aſhes* or Recrements, ſave only a little Moiſture which Taſted *Subacid*. Having ſuffered a larger piece to burn out, I had more Moiſture, which taſted like a weaker *Oleum Sulphuris per Campanam*. This puts me in mind, that moſt of my Friends, when they have ſeen this

this Experiment, are apt to call its Fume *Sulphureous*, and truly in all its Properties it ſeems rather referable to *Sulphur* than *Saline* Concretes, upon the ſcore of its *Inflammability*, as well as for this reaſon, that it neither loſes nor is Diſſolved in *Water*.

What *Medical* Uſe may be made of this Noble Concrete, time may diſcover. This I am ſure, that the Learned *Willis* (were he alive) would rejoice to ſee ſuch a Product out of our Bodies, who was very confident of ſomething Igneous, or Flammeous, or very Analogous to *Fire*, that did kindle and impregnate our *Blood*. Nor does the Ingenious Dr. *Lower* diſſallow ſuch an *Hypotheſis*, though he ſuppoſes an *Accenſion* of the *Blood* rather in the *Lungs* than in the *Heart*.

What Service this may do in helping us to explain other *Phænomena* of Nature, I ſhould be glad to know, particularly, as to that Obſervation of the Learned Dr. *Croon*, who, upon rubbing of his Body with a freſh and well warmed Shift, has made both to *Shine*; and alſo that of a worthy *Eriſtol* Gentleman, who together with his Son told me, that after much Walking, both their Stockings will frequently *Shine*.

2. 1. In order to try the *Elaſticity* of this *Shining* Subſtance when brought to a *Flame*, I made the following Experiment. I convey'd a quantity of it into a ſmall *Bubble* of *Glaſs*, as big as a Nutmeg (but blown very Thin in the Flame of a Lamp, that ſo it might be the more ſenſible of the *Elaſticity* of the Subſtance Expanding into *Flame*) then I Hermetically Sealed up the end of the Stem of this *Glaſs Bubble*, ſo that no *Air*, nor any thing elſe, could paſs out of the ſame without breaking thereof. Then I approached the *Sealed Glaſs* to the Warmth of the *Fire*, and as I expected, ſoon found it kindle into a kind of *Flame*, and to continue ſo to do by Emitting *Flames*, and as it were filling up the whole Capacity of the *Glaſs* for ſome ſhort time, after which it ſeem'd to be Extinguiſh'd without Breaking the Glaſs or ſo much as Cracking it. *Ph. Col.* n, &c. P. 84.

2. That I might be the better ſatisfy'd what this matter ſo *Flaming* did Reſolve into, I made this following Experiment: I made another ſmall *Bubble* with a pretty large Tube for the Neck, and left it open at the top to be as a Chimney to the *Fire* below it in the *Ball*; then I made the matter to Flame as before, by approaching it to the Heat, and found my Chimney as well as the upper part of the *Bubble* Lined with a yellowiſh *Sulphur*, which though thus *Sublimed* was not yet wholly diveſted of its *Shining* property, but when a little Warmed the whole *Bubble* would *Shine*.

3. To try at what rate it would *Burn* in the open Air, I made a piece of it *Flame* meerly by approaching it to the Warmth of the Fire, and found it to *Burn* like a piece of *Nitre*, but without any *Exploſion*, for it only *Flamed* away pretty nimbly.

4. I have further obſerv'd that it leaves a Red Tenacious matter upon its going out, that looks not unlike to Red Wax, and is ſo *Sour* that it ſets the Teeth on edge, and Diſſolves Iron.

5. Expoſing a Large piece of it, that was carefully weighed, it continu'd a great while *Shining* before the *Light* was quite Extinct; and examining the

quantity

quantity of the Liquor, that it Reſolved into, I was not a little ſurpriſed when I found it *thrice* its Firſt *Weight* at leaſt. Some that Taſted of it called it *Spirit* of *Sulphur*, others *Spirit* of *Salt*.

6. I attempted to make Mr. *Preſident*'s Experiment, by the application of ſome *wick*, to ſee if its *Light* and *Flame* could be more Concentrated and directed into one Body by ſome ſuch application, either to the *Solid* or *Fluid* matter, but I cannot as yet find any expedient of doing it; for ſo ſoon as the *Solid* matter kindles into an Actual *Fire*, it preſently Conſumes it ſelf and the *wick*; and the *Fluid* will not take *Fire* at all, though actually Heated, and ſo I could not drive it up the *wick*; nor is the *Light* Vivid enough to do any great Service. However I conceive the *Liquid* form may be much more uſeful than the *Solid* for giving *Light*, becauſe filling part of a large Spherical Glaſs of about 5 or 6 Inches Diameter with the *Fluid*, I found the whole Cavity of the Glaſs above the Liquor ſo filled with *ſhining* Steams, that I was able pretty well to Read a large Character thereby.

7. It being generally now agreed, that the *Fire* and *Flame* have their *Pabulum* out of the *Air*, I was willing to try this matter *in Vacuo*.

To effect this, I placed a conſiderable Lump of this matter under a Glaſs, which I fixed to an *Engine* for *Exhauſting* the *Air*; then removing the *Candles* for ſome time, I carefully obſerv'd at what rate it *Shined*: When I was well ſatisfy'd what degree of *Light* there was, I preſently Drew the Sucker of the *Engine*, ('twas one of Dr. *Pappin*'s make) and found it grow *Lighter*, though a Charcoal that was well kindled would be quite Extinguiſh'd at the firſt draught; and upon the 3*d* and 4*th* draught, which very well *Exhauſted* the Glaſs, it much Increaſed its *Light*, and continued ſo to *Shine* with its Increaſed Light, till I was weary with obſerving it, when I readmitted the *Air*, and ſaw it again return to its former Dulneſs.

8. Indeavouring to blow it up to a *Flame* with a pair of Bellows, I thought I had quite Blown it out, for it lay a good while Dead before any *Light* appeared.

9. All Liquors are apt to Extinguiſh this *Light* when the matter is plunged into them, nor will it *Shine* or *Burn* though you boil it in the moſt *Inflammable* Liquors, though it be *Oyl* of *Olives*, *Spirit* of *Turpentine*, or even *Spirit* of *Wine*.

A Parallel betwixt Lightning *and a* Phoſphorus; *by Dr.* Fred. Slare, *n.* 150. *p.* 189.

3. 1. In order to the keeping my *Solid Phoſphorus* from Conſuming, I uſually placed it at the bottom of a Glaſs of *Water*: Having ſeveral of theſe Glaſſes diſpoſed upon a Table in view, whilſt I lay upon my Bed, I could obſerve ſeveral *Flaſhes* of *Light* that ſucceſſively paſt through the *Water*, and made ſuch bright and vigorous *Coruſcations* in the *Air*, as would Surprize and Affrighten one not uſed to the *Phænomenon*. This *Fiery Meteor* paſſes ſomething contracted through the Incumbent Water, but Expands it ſelf much as ſoon as it gets above it. If you would make theſe Experiments to advantage, the Glaſs ought to be Deep and Cylindrical, and not above 3 *quarters* Fill'd with Water.

If we compare theſe appearances with *Lightning*, we may obſerve that *Lightning*, which comes at Intervals paſſes uninterrupted thro' the moſt con-

denſ'd

dens'd Clouds, and is not Extinguish'd or Obstructed by the greatest *Storms* or *Cataracts* of Water, but like the *Beams* of the *Sun* or any other *Fire* freely passes through Glass and Water.

2. This *Phosphorus* in the mention'd State only Emits these *Flashes* of *Light* in *Warm* Weather, a certain Temper of the *Air* being necessary to produce the effect; for in the *Winter* or *Cold* Weather, I never observed it.

The *Warm* Season of the *Summer* is most productive of *Lightning*.

3. The mentioned *Flash* of *Light* is not apt to kindle or *burn* any combustible Matter, as I found by holding my Finger in it unmolested, but not trusting to that, I held in the *Flame*, *Paper*, *Flax*, and such Materials as are apt to take *Fire*, which it did no more than when we projected the *Light* of the *Moon* by a *Concave* Glass upon the like Bodies.

Such an Inoffensive *Flame* that of *Lightning* is generally observed to be. But

4. The matter of the *Phosphorus*, whilst in a more *Condens'd* Body, will easily be *accended* by the *Warmth* of the Air, or by the Immediate Beams of the *Sun*, and then will *Burn* very furiously, with such a Penetrating *Fire* as will not easily be extinguish'd.

Thus *Lightning*, when *condens'd* or contracted, and wrapt up in a Vehicle of *Air*, so that it does not so easily Diffuse it self through the yielding *Æther*, will then set *Fire* to *Houses*, *Trees*, &c, and do great Mischief.

5. Our Matter whilst *Burning* acts the part of a *Corrosive*, and when it goes out it Resolves into a *Menstruum* that Dissolves *Gold*, *Iron*, and other *Metals*.

Thus *Lightning* Melts down, *Gold*, *Iron*, *Lead*, and other *Metals*.

These Experiments were concluded most Naturally to Illustrate and Resemble the *Phænomena* of *Lightning*, far exceeding either those made with *Nitre*, *Gunpowder*, or *Aurum Fulminans*.

XVI. Utinam Vir Illustris (D. *Boylius*) de Natura *Salium* Experimenta sua ampliora edere dignaretur, quomodò *Alcalia* seu *Lixivialia*, utpote *Fixa*, ab aliis *Acidis Austerisque*, non minus fere *Fixis*, discrepent, & utraque à *Volatilibus*, aliisque Speciebus *Salium*, nondum satis explicatis, atque crasi nomineque distinctis. Nam inter *Volatilia* differre videmus *Sal Urinosum* à *Sale* quod inest *Spiritui Vini* aliisque Inflammabilibus; quia Commixta *Coagulantur*, & novam Indolem acquirunt.

Some Chymical *and* Medical *Observations*; *by the* Heer Mich. Behm. *n.* 34. *p.* 650.

Magnam Spem habeo Inveniendi Liquorem, qui *Vesicæ* injectus blande comminuat *Calculos*.

Nuper *Serum* ex *Sanguine* Brutorum examinavi, & calore leviusculo *Coagulari* vidi adinstar fere Albuminis Ovi; potissimum addito *Acido* indurabatur: sed ab admixto *Spiritu Vini Serum* tenebatur diu *Liquidum*, magis tamen ab *Alcalibus*.

Boyle de Coloribus & de Fluid. & Firm.

Notavi *Podagram* & *Arthritidem* oriri, ubi *Urinosa* putrilago non separatur per *Renes* aut *Sudores* à Massa *Sanguinea*, sed cum ea distribuitur, & circa *Juncturas* in frigidioribus Ligamentis hæret, ubi propter *Salis* Acredinem *Dolores Acriores* (difflatiles tamen), vel propter Glutinositatem *Tophos* aut *Ri-*

gores

gores *Junctur arum* efficit. Utinam hujus Mali cauſas Sublimia *Anglorum* Ingenia penitius inveſtigare, & Orbi communicare vellent, ne Incurabile amplius inter *Medicos* cenſeatur. Id ipſum me valde fecit Anxium, præſertim cum diligenter notarem, Nil prodeſſe *Purgantia*, nil *Sanguinis* Miſſiones, parum *Sudores* & *Cauteria*, obeſſe *Emplaſtra Oleoſa* & *Refrigerantia* omnia; quinimo, *Spiritum Vini* & *Salis Armoniaci* non Satis elicere aut diſcutere totam Materiam. *Thermas* valde ſalubres eſſe norunt cuncti, & ipſe expertus ſum, præſertim quæ *Urinam* provocant; ſed quia non ubique ſuppetunt *Thermæ*, præbuit mihi Curioſitas Liquorem, qui *Odore*, *Sapore*, Virtute ſatis exacte æmulatur *Thermas*; iſta ratione membra ægra, reliquum vero Corpus ſimplici calida, balneando, levamen magnum ſentio. Porro expertus ſum, auſu proprio, inſignem medelam per Pilulas, quæ *Urinam* promovent, *Sanguinem* depurant Fluidioremque reddunt, *Calculi* Materiam atque *Scorbuticas* in *Meſenterio* viſciditates referant, abſque *Alvi* Turbatione. Verum per *Veſicatoria* (diſſuadentibus licet Medicis) Dolenti Parti adhibita, Optimam, Promptam atque Tutam hactenus per aliquot Annos mihi & Amicis inveni Medelam; quamvis eam aliis, ad *Fiſtuloſa Ulcera* pronis, non ſuaſerim.

De Morbis, quos ex Effervescentia *Acidi Succi Pancreatici* cum *Bile* in *Duodeno* derivat Nobil. Dn. *Sylvius*, hactenus valde dubito. Nunquam enim *Succum* iſtum ſenſi Acidum; neque *Bilem* per *Acida*, ſive *Mediocria* ſive *Acria* fuerint, *Effervescere* vidi, ſed potius *Coagulari* in fundo, uti ab *Acidis* ſolet præcipitari *Lac Sulphuris*, aliaque *Oleoſa*. Ideo per mixturam *Bilis* cum *Acido* Ciborum *Fermento* (quod certius apparet, quam *Succus* iſte) *Chylum* utiliter temperari, cum *Helmontio* credo. Tot vero Morbos ex Mixtura tali, licet faceret *Effervescentiam*, oriri negat Experientia.

Chymical *Experiments*; *by Dr.* Fred. Slare. *n.* 150. *p.* 291.

XVII. 1. We took betwixt 10 and 20 *gr.* of the *Solid Phoſphorus* and cauſed it to Melt in as much Water as would juſt cover it, which was about a *Dram:* after it was actually Cold we poured it into two *Ounces* of *Oyl* of *Vitriol*, which being well ſhaken together did firſt Heat, and then throw up ſuch *Fiery Balls*, which like ſo many Stars will adhere to the ſides of the Glaſs and continue to *Burn* for ſome time, and *Shine* not only in the Dark, but at Noon Day in the Enlightned Air.

2. If you pour a ſmall quantity of *Oyl* of *Turpentine* upon the foregoing Mixture it will take *Fire*, and Burn very furiouſly. This Experiment ought to be made in an open Veſſel where the Air has a free acceſs. This ſucceeded with *Oyl* of *Petroleum*, and *de Lateribus*: but *Sallet Oyl* and *Spirit* of *Wine* could not be made to *Flame*.

The Ingredients that compoſe this *Burning Mixture* are apart Cold to the Touch, and ſome of them in their Operations; thus *Water* and *Oyl* of *Vitriol* are Cooling in their Nature, but theſe in Conjunction cauſe a great *Heat* which ſoon excites the Particles of our *Phoſphorns* to an Actual *Fire*, and this Meeting with an *Inflammable* Ingredient, ſuch as *Oyl* of *Turpentine* or the like, does produce as conſiderable a *Flame* as Boiling Oyls are wont to do.

3. Ac-

3. According to the Directions of *Borrichius*, To make two Liquors *Kindle* one another tho' apart they are Actually Cold, we took 4 *Ounces* of freſh drawn *Spirit* of *Venice Turpentine* to 6 *Ounces* of *Aquafortis* newly drawn and very ſtrong. We Mixed them together in a *Glaſs-Body*, and accordingly placed the Veſſel in the Sun-Beams (which I foretold ſome of the By-ſtanders would deceive us); after half an Hour's Patience the Liquors began to *Ferment* very furiouſly, inſomuch that a very great *Smoak* was raiſed by this means, which was ordered to be kept down by a Cork that ſtopt the Veſſel. This condens'd *Red Fume* repreſented *Flame* by reaſon of the Beams of the Sun that were permitted to *Shine* upon it: But I was aſſured that this was a great Fallacy, and that the Experiment contradicted the Proverb, There is no *Smoak* without ſome *Fire*. I was willing to give the Experiment any advantage, which made me comply with that Circumſtance of doing it where the Beams of the Sun were admitted: But this very Circumſtance giving ground to the miſtake, I deſired leave to make the Experiment In a dark Room where we ſhould better diſcern any real Productions of *Light*; being aſſured that the *Action* of the *Liquors* would as certainly ſucceed in the Darkened Room as in a Light one. The Experiment was repeated, and the *Action* of the *Liquors* was no leſs Vigorous than in the former Experiment. Moreover *Flax*, being lookt upon as a very Combuſtible matter, was ſuſpended in the *Fume*. But in ſhort, the Obſervers of this Experiment, which were many and very inquiſitive, could not diſcover the leaſt Spark of *Fire* or Glimpſe of *Light*, ſo that the *Flax* remained Untouched, and the *Fermenting Liquors* gave no *Light*, *Fire*, or *Flame*: only take this Caution; keep your Candles at a diſtance, for the *Fume* will ſoon take *Fire* at any *Actual Flame* and ſet the Liquors a *burning*, and ſo it may impoſe upon the Careleſs. Bartholine's Act. Hafn.

4. Amongſt thoſe various Mixtures, wherein great *Heats* and *Effervеſcencies* with much *Ebullition* were produced, none were ſo conſiderable as this; Upon an *Ounce* of *Spirit* of *Nitre*, if you pour 2 or 3 *Drachms* gradually of the *Higheſt Rectified Spirit* of *Wine*, the *Heat* and *Ebullition* will be incredibly great. And whereas in the former Experiment you muſt wait a good time for your *Effervеſcence*, here 'tis performed in an Inſtant; ſo that I had more reaſon to expect, from the mighty *Action* of theſe *Liquors* upon each other, a production of *Actual Fire* or *Flame*, than from *Borrichius* his Experiment.

Poſſibly ſome may be ready to Imitate this Experiment which may fail them, unleſs they obſerve ſome little Directions. Errors of this kind, have made ſome People believe they are Impoſed upon when there is no ſuch thing. *Common Spirit* of *Nitre*, ſuch as was firſt Diſtilled into Water and afterwards *Dephlegmed* (or Diſtill'd ſo as to have all the Water ſeparated) this will fail your Expectations; it muſt be the *Red Spirit* of *Nitre*, and a very *High Rectified Spirit* of *Wine*. In the next place, you muſt firſt pour into your Glaſs the *Spirit* of *Nitre*, which is the heavier Liquor, and then the *Spirit* of *Wine* after, for if you invert the order you will have no *Ebullition*, which will not a little puzzle the Reaſon of Philoſophers.

In this Experiment (eſpecially if the Ingredients are made very *High*) the *Spirit* of *Nitre* does as it were act the part of a *Coal* of *Fire*; as *Fire* Exhales

and Drives up Water that is thrown upon it, ſo does this *Spirit* of *Nitre* very furiouſly throw up a great quantity of the *Vinous Spirit*, inſomuch that it preſently Perfumes a Room with the Smell. But to be more exact in this Obſervation, we Mixed equal parts together in a *Retort*, and then Cemented a *Receiver* of good Dimenſions, and ſo we Condenſed that Vapour which Riſes from this Mixture and obtained much of our *Spirit* of *Wine* again.

Both theſe Experiments may ſerve as Arguments againſt the Notion of *Acidum* and *Alcali*, ſince mighty Conflicts may be excited by Bodies of differing Textures where theſe two Principles are not Conſpicuous. We have here indeed very ſtrong *Acids*, but in the other never were any *Alkali*'s ſuſpected whether *Volatile* or *Fixt*. Nor can I think that that Latent *Alkali*, imagined to be in the *Spirit* of *Nitre*, does produce this great Conflict; for I queſtion whether there be any ſuch thing; if it be an *Alkali*, it has quite loſt its property, that 'tis not wrought upon by ſo ſtrong an *Acid* in whoſe Boſom it lies. Wood may as well remain Incombuſtible in a great Fire, as ſuch an *Alkali* under the power of ſo great on *Acid*. But this is only a hint.

5. There are various *Liquors* whoſe Mixtures are apt to produce greater or leſſer *Effervescencies*, *Heats* and *Inflammations*, ſo that particularly the great *Incaleſcence* and *Burnings* in *Feavers* are eaſily accounted for, and made obvious by occurring Experiments. There ſeems more difficulty to account for ſome *Cold* Diſaffections of the *Blood* and other Juices of the Body. For *Hyſterical* Perſons will complain of a great *Chilneſs* or *Froſt* in the *Blood*, during that *Paroxyſm*, ſuch as a good Fire and Warm Cordials will not eaſily conquer. In theſe Perſons the *Pulſe* is always very Tardy, (differing from what I have obſerved in *Agues*, where in the *Cold Fit* it has been very Quick.) This may be better explicated by a Solution of *Sal Armoniack* than of *Nitre* in *Water*.

In about a *Pint* of *Water* we Diſſolved about a *Quarter* of a *Pound* of *Sal Armoniack*, which was found to be ſo very *Cold* to the Touch, that we needed no *Weather-Glaſs* to convince us of the Effect.

In this Experiment we have no *Ebullition* or *Swelling* of the *Liquors*, but rather a *Condenſation*, which may alſo happen in the *Hyſterical Frigid Paroxyſm*, for in caſe the Humours Swelled they would require more ſpace, which perhaps is not to be allowed, but muſt then be Compenſated by the *Acceleration* of the *Pulſe*, which would then be obliged to tranſmit the Extended Humours in a ſhorter Time; but this is not our Caſe here, but refers to the next. I here choſe to explain the *Affections* of the *Blood* by the Solution of *Sal Armoniack* that (as we ſaid in our Experiment) Affected the *Blood* of thoſe Perſons that long Touched it, with a ſenſible and troubleſome degree of *Cold*. For the Maſs of *Blood* may be very apt to degenerate into ſuch *Concretions* as do much reſemble *Sal Armoniack*; and this will ſeem more probable if we conſider that *Human* and other *Blood* naturally abounds with *Urinous Salts*, and do preternaturally Degenerate into *Acrimonious* and *Pungent* Juices, which may be much promoted by a too liberal Uſe of high Seaſoned or Salted Meat, and Sour Liquors. For this we find by Experience that ſuch an *Acid* as *Spirit* of *Salt* mixing with an *Urinous*, will be

con-

converted into *Sal Armoniack* (which has now loſt much of its *Volatile* Nature). This we may plainly Diſcern by its Shooting into a Figure, that reſembles Feathers, which is proper to *Sal Armoniack*. That the *Blood* does abound with various ſorts of *Salts* is not to be doubted; and that it has ſuch a *Salt* as ſome call *Salſum*, which is *Sea-Salt*, I lately exhibited at the *Royal Society*; and laſtly that *Sal Armoniack* has its principal dependance on great quantities of *Volatile Salt* (ſuch as the *Blood* is ſtored with,) and on this mentioned *Salt*, is very well known. So that having preſuppoſed ſuch Concretions as theſe to have their Exiſtence in the *Blood*, we muſt conſider how they come to Act. That there may be ſome Antecedent and other Concomitant Cauſes of *Hyſterical Paſſions*, I do not deny; I only or principally conſider the Cauſe of the *Cold* Affections.

'Tis very probable that the *Glands* do ſuffer great Obſtructions, which are antecedent to this *Paroxyſm*; I am the rather inclin'd to this Opinion, by reaſon of ſo great a *Thirſt* as our Patients are apt to complain of before and in the Fit: by which Obſtructions the uſual Secretions of the *Lympha* are hindred as well from watering the Mouth as the *Oeſophagus* and *Stomach*, which cauſes *Thirſt*. Moreover, the leſs quantity of *Lympha* is Evacuated the uſual way, the more is abſorbed by the *Veins*, which does ſo Dilute thoſe *Salts* in the Maſs of *Blood* as brings them to a *Fluor*, or ſuch Solution as is neceſſary to give the *Cold* Effect. Thus *Sal Armoniack* will Mix with ſome Liquors and not with others, ſcarce at all with *Spirit* of *Wine*, and not ſo well with *Wine* as *Water*, and the more Limpid the Water is, the better and ſooner it Diſſolves, and to this Menſtruum does eſpecially impart this *Cold* Operation. Which not unreaſonable Conjecture of an extraordinary Effuſion of *Lympha* into the Maſs of *Blood* at ſuch a time, is further Confirm'd by that great quantity of *Urine* thoſe Perſons are apt to make; which has made ſome fear a *Diabetes* that have not been well verſed in ſuch Caſes: For the *Urine* here will look very Pale and Limpid. And this may be further proved, that when the *Cuticular Glands* are hindred from doing their *Tranſpiring* Office, particularly by any Cold Ambient Fluid which happens to them that go into Water, that then they are obliged to throw off greatter quantities of *Urine* which has been obſerved by me to be very Pale and Inſipid, after a 2*d* or 3*d* Evacuation.

6. If we take any *Acid*, whether of *Vinegar*, *Verjuice*, *Wood-Sorrel*, *Oranges*, *Lemons*, or perhaps yet Milder ones, by caſting into theſe Juices a *Volatile Salt* of *Human Blood*, I always obſerved a notable *Ebullition* would enſue, which I never could find would *Heat*, as ſuch Boiling Liquors are apt to do (and one would expect they ſhould): But on the contrary affected a good *Weather Glaſs* ſo as to make the Liquor Deſcend, which was a manifeſt Token of *Cold*. There I found that the Higher the *Acid* was, the greater the *Ebullition* and the *Cold* would be; which is very remarkable. For this reaſon I made uſe of very ſtrong *Vinegar*, Dephlegmed by *Freezing* (which way is taught by the Honourable Mr. *Boyle*, to whoſe great Favours and Manuduction I muſt aſcribe whatever Service I ſhall be able to do *Experimental Philoſophy*,) and by this Mixture we came much nearer the *Freezing Point*. But ſince it proves troubleſome to prepare this *Vinegar*,

and becauſe it can be done only at certain times, I have moſt commonly made the Experiment with *Spirit* of *Venus*, or *Verdigreaſe*, which is the Higheſt *Vinegar* in the World; With this the *Cold* will be moſt Senſible to the Touch, and moſt conſpicuous on the *Weather Glaſs*. For by this Mixture I have in the *Summer* made a *Weather Glaſs* to Deſcend below the Temperament of Cold Fountain-water, 6 *Inches* at leaſt, which brought it ſo near the *Freezing* Mark that it ſcarce wanted *half* an *Inch*. But at the ſame time the Liquor *Swells* and takes up more room than before, and will not be contained in Shallow Veſſels. In this Experiment we have ſome things very Rare, that a great and violent motion of two Diſſenting Liquors, ſhould be ſo far from producing *Heat* as to produce a notable degree of *Cold*, and that too with a conſiderable *Expanſion* of their parts. Here we might Inſtance in an appoſite and as unexpected an Experiment, where an Effect contrary to our common Obſervation happens, and that is thus; If you Mix with *Oyl* of *Vitriol* a quantity of *Water*, a great *Heat* will follow without an *Expanſion* of theſe Liquors, whereas *Heat* does conſtantly produce it in *Wine*, *Water*, and moſt *Fluid* and *Solid* Bodies: For here it rather *Shrinks* and *Condenſes*, as you may ſee by making the Experiment in a Glaſs with a long Neck and ſetting your Mark as ſoon as you make your Mixture. Both theſe Inſtances may a little puzzle the *Carteſian Hypotheſis* to account for, tho' I am far from thinking they are able to deſtroy it. But to proceed with our Experiments, after I had ſufficiently ſatisfy'd the worthy Spectators, that the produced degree of *Cold* was very conſiderable, I then poured in ſome few Drops of another Liquor, that ſoon altered the Temper of our *Cold* Mixture, and in two or three Minutes brought it to a warmth beyond that of the Ambient Air, though it was a very warm Sun ſhining Day, in *July*.

To apply the Experiment. In the *Cold Fit* of an *Ague* we have often a Strong and Quick *Pulſe*, which argues an *Ebullition* (tho' I dare not call it an *Effervеſcence*) and Quick Motion of the *Blood*, and the *Pains* of the *Head* and other Parts may be due to too great Diſtreſs or Extenſion of the Veſſels, which depends on the *Expanſion* of the Boyling Humours. In this Artificial tho' *Cold* Mixture we obſerve, a mighty *Commotion* and High *Ebullition* and *Expanſion* of the *Liquor*. In the *Blood* and other Juices of the Body we conſtantly diſcover great Quantities of *Volatile Salts*, and ſometimes either from an Infected Air, or bad Dyet, and from ſeveral other Cauſes, *Sour* Juices may be derived to the *Blood*, which may ſo act upon thoſe *Volatile Salts*, the *Blood* ſo much abounds with, as to give a notable Senſe of *Cold*. It is no new thing for us to meet with Patients, that have thrown upon their *Stomach* and *Bowels* (which are the great *Emunctories* of the *Blood*) very *Sour* Liquors, ſuch as when they happen to fall upon the *Teeth* will Corrode thoſe Hard Parts. Thus in our *Experiment* 'tis plain, that a forreign *Acid* meeting with a *Volatile Salt* drawn from the *Blood*, does produce a *Cold Effect*; and ſince we know no Liquors but a Mixture of this kind that gives ſuch a *Cold Phænomenon*, it ſeems not unreaſonable to believe that the *Cold Fit* of an *Ague* may be due to ſuch a Mixture.

As to the *Incaleſcence*, made in our Mixture, I ſhould have told you, that it

was done by the bare addition of ſome Drops of *Oyl* of *Sulphur per Campanam*, being a Liquor that owes its origine to the *Fire*, I ſuppoſe it to have borrowed that *Calorifick* Quality thence, which made it repreſent the *Hot Fit*: For this I obſerved, that notwithſtanding the Action of the *Cold* Mixture, it Grew more Thick and Slimy than 'twas at firſt, and that the addition of the mention'd *Oyl*, or *Spirit* of *Brimſtone* made it more clear and Fluid. Thus the Agile Spirits of the Human Body, which tho' they cannot be thought to be Actual Fire, yet are ſuppos'd to be ſomewhat Analogous to it, being in more abundance pour'd into the Turbid Maſs of *Blood*, do by their Warmth and Action firſt Attenuate thoſe groſs *Coagulums*, and then manifeſtly Subdue, and Reduce many of thoſe Indiſpoſed Particles to a good Texture, and Expel thoſe that are diſagreeable by *Sweat* and *Urine* or both ways; which is a good *Prognoſtick* of a Cure of that *Paroxyſm*.

I ſhall only add this Objection made, *viz.* That there are no ſuch *Acids* of ſo High a Degree of *Acidity* found in the Human Body as we make our Experiments with. To which I may Anſwer, That there is no need alſo of ſo great a Degree of *Cold* to put our *Blood* into an *Ague*, a ſmall declination from its uſual Temperature, being ſufficient to make us very Senſible.

7. A *Member* of the *R. Society* having propoſed to try if the *Cortex Peruvianus* would not prevent this *Artificial Ague*, we made a ſtrong *Infuſion* of our *Bark* in common *Vinegar*, and then injected a Quantity of the mention'd *Volatile Salt*, a conſiderable *Commotion* of the Liquor enſued with a Degree of *Cold*, but was not altogether ſo fierce as formerly; Moreover it abated much of Riſing to the Height of the former Experiment, when *Opium* was mixed with the mention'd *Cortex*: tho' in this Caſe the *Acidity* was far from being quite Mortify'd. As to the *Cortex* I do not intend in this Experiment to explain its Nature, which was only made to ſatisfy that Sagacious Gentleman's Curioſity: For I never thought that *Febrifuge* did Act the part of an *Alkali* in performing the Cure. But if I can make it appear that there are other Medicines that do pertain or belong to the Family of *Alkalies*, which are Effectual in the Cure of *Agues*, this may ſerve to prove, that they do it by deſtroying ſome Morbid *Acidities* in the *Humours* or *Viſcera*, and ſo prevent the uſual *Commotions* ſuch diſagreeable Liquids are apt to make upon their Conventions. This is manifeſt that *Coral* and *Crabs Eyes* and other *Teſtaceous* Bodies numbred amongſt the *Fixt Alkalies*, and not only theſe but thoſe real *Fixt Salts*, as *Sal Abſynthii*, *Cardui Benedicti*, &c. as well as the *Volatile Salts* in general, do Highly Correct and Change *Acid* Humours where they can meet them, and not only ſo, but do hinder Liquors that are apt to Sour and Corrupt from Degenerating; (thus *Milk* and *Blood* it ſelf may be preſerved much longer; the firſt from growing *Sour*, the laſt from *Fermenting* and *Putrifying* by a quantity of *Volatile Salt* or *Spirit* mixt with them;) which is in like manner granted to be true, that many *Agues* have been Cured by Medicines of this Nature; *Sal Abſynthii* as well as *Volatile Salts* are uſed as the principal Ingredients in common *Febrifuges*. For a farther proſecution of this Experiment, we Diſſolved as much *Chalk* as Strong *Vinegar* was able to do, and then having ſtrain'd it through a Filter, we pour'd it upon a Quantity of the *Highly Rectify'd Spirit* of *Blood*, but found neither *Ebullition*, or any Senſation of *Cold* or *Heat* to follow.

XVIII.

N. 213. p. 200. XVIII. 1. *A Catalogue of those* Oils *that will take* Fire *with a great* Noise *and* Explosion, *when the* Compound Spirit *of* Nitre *is poured upon any of them; and of those* Oyls *that do only make a great* Noise *with* Explosion, *but will not take* Fire; *and also of those that do not make either* Effervescence *or* Explosion. *The* First *is marked with two Stars* **. *The* Second *with one* *. *The* Last *has no mark at all. By Dr.* Fred Slare.

OYLS

- *Essential*
  - Perfect *Stillations* made by the *Analysis* of the *Chymical Fires*, where the *Oleaginous* Particles are truly separated from all other,
    - *Carvi* **
    - *Cummin* *
    - *Fennel* *
    - *Dill* *

    } *Seeds.*
  - *Vegetable*
    - *Light*, or *Æthereal*, which are *Specifically* Lighter than *Water* and *Brandy*, and some than *Spirit* of *Wine*, and are usually drawn from the *Seeds* of *Vegetables*: Such as from,
      - *Juniper* * } *Berries.*
      - *Bay* *
      - *Thyme* *
      - *Wormwood* *
      - *Angelica* *
      - *Hyssop* *
      - *Lavender* *
      - *Rosemary* *
      - *Penny-Royal* *
      - *Rue* *
      - *Sage* *
      - *Savin* *

      } *Tops of Plants.*
      - *Lemons* *
      - *Oranges* *
      - *Nutmegs* *
      - *Cloves* **

      } *Fruits.*
    - *Ponderous* or Heavy, which do commonly Sink in *Water*, being Distilled from the Heavy parts either of the *Wood* or *Cortex* of *Trees*. Such as from
      - *Sassafras* **
      - *Guajacum* **
      - *Box* **
      - *Camphire* **

      } *Wood.*
      - *Jamaica Pepper* **
      - *Cinamon* **

      } *Cortex.*
- *Not-Essential*
  - *Imperfect*, made by *Expression*, which are Decompounded of several Parts of the *Plants*; as of
    - *Almonds*
    - *Olives*
    - *Walnuts*

    } *Fruits.*
    - *Line*
    - *Rape*

    } *Seeds.*
  - *Animal* of *Solid* Parts
    - *Hartshorn* **
    - *Man's Skull* **
    - *Hoofs* **
  - *Fluid*, — *Humane Blood* **
  - *Mineral* of
    - *Amber* or *Succinum.*
    - *Petroleum.*
    - *Barbado's Tarr.*
    - *Bee's Wax.*

Spirit of *Wine* will give some flashes of *Fire.*
Balsam of *Sulphur*, a Compound Body made with *Oyl* of *Turpentine* and *Brimstone*, if not too Thick, will *Flame.*

You have *Twelve* sorts of *Oiles* that do make *Ebullition*, *Explosion*, and *Flame*; 18, *Ebullition* and *Explosion* without *Flame*; 4, that produce *Neither*; by the mixture of our *Compound Spirit* of *Nitre.*

2. Take

2. Take of any one of the *Essential Oyls*, set down in the Catalogue, one part; of the *Compound Spirit* of *Nitre* two parts; (these may be *Drachms* if you please) and they will with great Celerity and a great Noise produce a *Flame*, which lasts a very little while, but leaves an insipid *Caput Mortuum*, as Light and Tastless as a Cobweb.

A Mixture of Two Cold Liquors producing an Actual Flame. *ib. p.* 201.

Note 1. This Experiment should be made under a Chimney, or any convenient Draught, that so the Offensive Steams may Evaporate.

2. A Gally-pot spacious enough to hold 4 or 5 *Ounces* of Water, may be a convenient Vessel for this Experiment, if you only use the fore-mention'd Proportion; but if you please to use larger Quantities, then you must enlarge the Vessel.

3. You must put the *Oyl* into the Gally-pot first, and then pour the *Spirit* on the *Oyl*, because the *Spirit* being Heavier, does the better pass through the *Oyl*, and make a more expeditious Mixture. This must not be dropt in gradually, but convey'd in altogether.

4. Hold not your Head too near the Gally-pot, lest the sudden *Explosion* of the Matter should strike up some of it in your Face.

5. The *Compound Spirit* will loose much of its Vertue if kept too long.

3. Take of *Salt Peter* and *Oyl* of *Vitriol* equal parts, and *Distil* these out of a *Retort* in a good *Sand Furnace*, so that the Sand continue Red Hot for some Hours; for the *Fire* cannot be too great: The *Fumes* will rise of a very deep Red Colour, and will settle in the *Receiver*, in the form of a Liquor, which must be carefully preserved from the Air; this being the *Spirit* with which all our Experiments were made, which are refered to in the Catalogue.

The way of preparing the Compound Spirit *of* Nitre. *ib. p.* 202.

To make the common *Spirit* of *Nitre*, you need only to mix 5 or 6 times as much Clay as you take of *Nitre*, and *Distil* them in a *Retort*, and you may obtain a strong *Spirit* of *Nitre* this way, especially if you *Dephlegm* it, and *Rectify* it to the best advantage.

With this we have made an Experiment of *Accension* that succeed sometimes, but with great uncertainty; but the first, which I call the *Compound Spirit* of *Nitre*, is only to be relyed on.

This *Compound Spirit* seems to be the Active Principle that stirs up the *Oily*, or more Passive Particles to take *Fire*; which will more easily be agreed to, if we consider that our *Compound Spirit* of *Nitre* does not only consist of all those *Igneous* Particles to be found in *Common Spirit* of *Nitre*, but that it has also all those *Igneous* Particles which *Oyl* of *Vitriol* contains in it, crowded into our *Spirit* of *Nitre* made this way.

For further Illustration, let us consider, That *Oyl* of *Vitriol* is a Creature of the *Fire*; That the *Sulphur*, which is plentiful in *Vitriol*, or in *Copperas*, is *Accended*, and afterwards *Distilled* over in the form of a Liquor, which is a Liquid sort of *Fire* as having many Properties of it; If you put it to Water it will make it *Boyling Hot*; It *Burns* not only Linnen and Wollen, but Wood to a Coal; and scarce spares any thing.

Nitre, the other Ingredient of our *Spirit*, is very susceptible of *Flame*, which does also incorporate many *Igneous* and Corrosive Particles after it has

so

ſo many Hours lain Ignited in the *Fire*; comes over, by *Diſtillation*, very highly Impregnated with the ſame *Fiery* Particles; which is obvious to any one that has uſed to make Experiments with it. For *Nitre* it ſelf has no Diſſolving or Heating Quality, but is a great Cooler, and ſcarce can be reckoned amongſt *Acids*; but after it comes out of the *Fire* in the form of a *Spirit*, it Tears in pieces almoſt all Metals, and brings them to a ſort of Fuſion, as *Actual Fire* does; it Diſſolves Animals and Vegetables, and Minerals; and has many Effects of *Fire*. Therefore from an Union of theſe two very *Fiery Spirits* reſults a much greater Quantity of *Igneous* Matter.

That *Fire* is very apt to Incorporate with Fluids, and even ſuch as have had but a ſmall Communication with it, an Experiment, which I formerly exhibited at a *Meeting* of the *R. Society*, makes probable.

We took of *Spirit* of *Wine*, that was Highly *Rectify'd*, a Wine Glaſs half full, and placed a Tender Weather Glaſs or *Thermometer* in the Glaſs, and then put a Spoonful of Water to it, this immediately *Warmed* the Liquor, and made the *Weather Glaſs* Aſcend two Inches at leaſt: The Liquor in the *Weather Glaſs* ſubſided as the other Mixture grew *Cold*. I made it alſo Senſible to the Touch by filling the Palm of the then *Preſident*'s Hand with *Spirit* of *Wine*, and putting a ſmall quantity of *Cold Water* into the ſame Hand, which made it ſenſibly *Warm* his Hand, as well as others that made the Tryal. But from this *Spirit*, which is too *Volatile* to endure much Communication with the *Fire*, you may expect only a Mild Tepid *Heat*. I am apt to believe, that there is ſcarce any thing which lies long in the *Fire*, but is apt to retain ſome *Igneous* Particles; which does appear to be ſo in all *Fixed Salts*, in *Quick Lime*, and more particularly in *Iron*. If you take a Bar of *Iron*, though of an 100 Years old, and *File* off about a Pound of it, and then you do Mix and Imbibe theſe *Filings* with a due proportion of *Water*, enough to make the whole juſt moiſt; the *Fire*, which all this while lay concealed in the *Iron*, being more diſpos'd to enter into the *Fluid*, does by theſe means *Warm* the Whole Maſs. The *Iron* gained this *Heating* Quality by *Fuſion* in thoſe Fierce *Fires* which firſt ſeparated the *Metal* from the *Ore*: For it is not in the Nature of the *Ore* before *Fuſion* to Emit any *Heat*, as I have found by mixing *Water* with it. There are a great many other Inſtances which make it very plain, that *Fire* will add both to the Bulk and Weight of Bodies; but theſe Affect Solid Bodies more manifeſtly. The Effect it ſelf produced by our *Fluid*, does neceſſarily Prove the Inherent *Fiery* Particles to have cauſed the *Accenſion*.

And this leads us to conſider the other part of our Matter, which in Conjunction with the *Compound Spirit* cauſes this *Accenſion* and *Exploſion*.

But here it will not be amiſs to premiſe a Diſtinction of *Oyls* into *Vegetable*, *Animal*, and *Mineral*; having made ſome Experiments with all theſe, but moſt of all with *Vegetable*; for which reaſon we Subdivide again the *Vegetable* into thoſe made by *Expreſſion*, and thoſe made by *Diſtillation*: And of thoſe made by *Diſtillation* we diſtinguiſh thoſe that are made out of the *Seeds* from thoſe that are made out of the *Trunks*, or *Cortex*, or *Roots*, or any other part of the *Vegetable*. We further obſerve a Difference betwixt

thoſe

thoſe *Seeds* that have only a Fragrant Smell and a Pungent Taſt alone; thoſe that have both Odorous Emanations and a Brisk Taſt together, and thoſe that are Inſipid and have no ſmart Taſt.

In the firſt place we muſt ſet aſide thoſe *Oyls* made by *Expreſſion*. For having tryed *Oyl* of *Line-Seeds*, of *Nuts*, of *Olives*, of *Almonds*, &c. we found theſe would not make *Exploſion*, or *Ebullition*, or ſo much as any *Fermentation*, with our *Fiery* Meteor. Nor could I without much ſtirring bring them to Incorporate: And when they did Incorporate the *Heat* was but juſt Senſible; and the Reaſon may be becauſe this ſort of *Oyl*, though it muſt be allowed to be a True *Pabulum Flammæ*, for it may be made to *Flame* all away, yet it is not a True *Oyl*, although it muſt be allowed to have one Property of *Oyl*, that it mixes not with Water; yet it doth not ſtand the Teſt of the *Fire*, for if you *Diſtill* it, you may part from it *Water* and *Earth*, and *Soot*, and a true *Eſſential Oyl*, which afterward will bear repeated *Diſtillations* without any further *Diſſolution*.

Having ſet by theſe *Vegetable*, but not *Eſſential Oyls*, we will briefly examine the *Mineral Oyls*, of which there are ſome, as *Oyl* of *Vitriol*, *Oyl* of *Sulphur per Campanam*, that have not any property of *Oyls*, but are rather *Acids*, and Corroding *Menſtruums*. There are others which have the true Property of *Eſſential Oyls*, as *Oleum Petreoli*, and *Barbadoes Tar* highly Rectified, which do not produce any remarkable *Heat*, much leſs make an *Ebullition*, or *Exploſion*: Nor does that Active *Oyl* of *Amber* do any thing more.

The *Stillatitious Oyl* of *Bees-Wax* had much the ſame Effect, when it was Incorporated with our *Compound Fiery Spirit*: And this inclines me to believe that the *Wax* it ſelf may be a Compound more belonging to a *Mineral* than *Vegetable* Nature.

And now we will examine thoſe *Eſſential Oyls*, which do Produce great *Ebullition*, *Exploſion*, and *Flame*, with the *Compound Spirit*. Of theſe we have 2 ſorts *Vegetable* and *Animal*.

The True *Vegetable Eſſential Oyls* do all of them make violent *Ebulllition* and *Exploſion*, and ſeveral do Actually take *Fire* and *Flame*, as the Catalogue of Experiments do Specify.

If it be enquired into, what ſhare the *Oyl* has in Producing this *Fire*, whether only it be a *Pabulum*, or Fewel, for the *Spirit* to Actuate, and ſo be meerly Paſſive? Or whether it contributes any Particles that do help to excite this *Flame*?

In order to Reſolving this Doubt, we conſider, That theſe *Eſſential Oyls* are produced from *Seeds* that have very Active or Warm Parts or Spirits, ſuch as will eaſily Ferment and Heat, and having a Warming Influence upon our Tongues, and do give Heat to the Stomach and Blood of Animals. That the *Seed* is the Syſtem or Concentration of the whole *Plant*, and has *Spirit* or *Ferment* enough lodged in it to Aſſimilate all that Inſipid Watry Element (which contributes Matter to its *Growth*) into its own Nature; from hence the great quantities of *Eſſential Oyls* are produced. Its true, out of the *Trunks*, and *Roots*, and other Parts of *Trees*, we have *Eſſential Oyls*

Extracted, but with a vaſt Diſparity, there being only a very ſmall Quantity (in Proportion to what is in the *Seeds)* Floating up and down the other Parts of the *Vegetable.*

But I am not only to take notice of the Potential Warmth of the *Vegetable*, there being in my Opinion another Ingredient fit to be obſerved, which our *Eſſential Oyls* may be proved to contain, and that is a *Volatile Salt*, which gives much of that Pungency to the Taſt. If we conſider the Conſtituent Parts of theſe Active *Vegetables*, they much abound with *Salts*, which by a Moderate Fire are made *Volatile*, and by a Violent Fire are *Fixt.* This ſeems to me more than probable by what I have found in a quantity of *Oyl* of *Cinnamon*, having had it in my own keeping for 20 Years; for about 10 or 12 Years it continu'd the ſame, but within theſe 6 latter Years it has Annually let fall ſome *Salt*, inſomuch that it is now one half of it turn'd to *Salt*, and this without any Addition or any Art uſed to Reduce it to this Form.

There is alſo Separated in *Diſtillation* of great quantities of *Vegetables*, as of *Thyme*, *Organ*, *Penny-Royal*, *&c.* a *Volatile Salt* of a peculiar Nature (which our excellent Chymiſt Mr. *Molt*, firſt ſhewed me, and keeps quantities of it by him) this is very Clear, or Chryſtalline; in its *Specifick Gravity* a ſmall matter Heavier than Water; and ſeems to be *Salt* and *Oyl* Coagulated into a Body: It will not Diſſolve in Water, but eaſily Evaporates when Heated. I now conſider theſe *Salts* as *Alkalies*, which all true *Volatile Salts* are, they do preſently *Ferment* and make great Colliſion with *Acids*, and therefore I am much inclined to make this Inference, That *Our Oyl* is not a bare *Pabulum Ignis*, or an Unactive Principle, but does upon a double account, as well upon the ſcore of the Incaleſcent *Oyl* as of the Inherent *Salt*, conſpire with the *Compound Spirit* to make this great *Heat*, *Exploſion*, and *Accenſion.*

In the *Catalogue* of Experiments, we may further obſerve, That of the Light *Eſſential Oyls* drawn from *Seeds* of *Vegetables*, All of them do make a great *Ebullition* with an *Exploſion*, but that few of them do actually take *Fire*; and that All of thoſe that are drawn from *Trunks*, or other parts, of our *Vegetables*, do certainly take *Fire* and *Flame.* Wherefore having obſerved that thoſe that do not take *Fire*, or *Flame*, did yet make as great an *Exploſion* and *Ebullition*, and probably as great an *Heat* as thoſe that did, I was apt to impute it to the Lightneſs and too great Subtility and Volatility of thoſe *Eſſential Oyls*, whoſe very Active Particles did too ſoon Exhale or Fly away. And this Conjecture is ſomething juſtify'd by the Addition of a more Ramous Body, (which was *Balſam* of *Sulphur* made with *Oyl* of *Turpentine*) to our moſt *Volatile* or *Subtile Oyls*, which then produced a *Flame*, whoſe Particles being more Craſs or Ramous, will detain the more *Volatile Oyl* from too ſoon an *Exploſion*, and give more time to the *Fiery Spirit* to Penetrate, and Mix it ſelf with thoſe Combuſtible Materials. And this may be one Reaſon why the *Ponderous Oyls* Diſtilled from the Roots or Ligneous Parts of a *Plant* do All take *Fire*; namely, becauſe the parts of this ſort of *Oyl* lying cloſer together, do not ſo ſoon diſſipate after the *Spirit* is caſt upon

upon it. And then as to the *Specifick Gravity* the difference is alſo very conſiderable, which any one may find by this familiar way: If you fill a Glaſs with one *Ounce* of the *Eſſential Oyl* of the *Seeds*, you will require 9 *Drams* of the *Ponderous Oyl* of the *Vegetable* to fill up the ſame ſpace.

This is alſo very obvious to any Spectator, that moſt of theſe *Oyls* thus Diſtilled are more *Ponderous* than common Water, by their Sinking to the Bottom; whereas all our *Eſſential Oyls* drawn from the *Seedy* Parts, do Swim on Water, and ſome are Lighter than the beſt *Rectify'd Spirit* of *Wine*, but moſt are Lighter than *Brandy*, which has made our Chymiſts call them *Æthereal Oyls*.

In the *Catalogue* of Experiments, you may find which are the *Ponderous Oyls*, that do conſtantly take *Fire*. Moreover the *Ponderous Oyls* have yet one Advantage above the *Lighter Volatile Oyls*, they having been expoſed to a longer and ſtronger Degree of *Fire* than the others, and ſo do Incorporate more *Igneous* Particles with themſelves, which being put in Motion, may contribute ſomething to cauſe this *Accenſion*.

The *Oyls* Diſtilled from *Animal* Bodies do All of them take *Fire* and *Flame*, but with this Difference, they do not make ſo great an *Exploſion* as the *Vegetable* do, but do more Certainly take *Fire*, and will continue their *Flame* longer, but not ſo Fierce as the other. If we rightly examine the Conſtitution or Texture of this *Oyl*, we have ſeveral Properties adapted to the Production of this Effect. You have a much greater Degree of *Fire* required in the *Diſtillation* of this *Oyl* than is neceſſary for that of the *Vegetable*. You have alſo a great Quantity of *Volatile Salts* (which are true *Alkalies*) that do paſs over with your *Oyl*: And you have a *Ponderous Oyl*, that Sinks in Water; which being conſidered and weighed together, do make it Equitable to expect a more Conſtant *Accenſion* from the *Animal Oyls* than from any other.

Oleum Succini, is juſtly put in the *Catalogue* of *Minerals*, and is produced by a ſtrong Degree of *Fire* (as is above mentioned) yet does it not make any *Motion*, and ſcarce any *Incaleſcence* with this *Oyl*, notwithſtanding its abounding with *Volatile Salts*: The Reaſon is, becauſe theſe *Salts* are not properly *Volatile*, as *Alkalies* are, but do belong to the Family of *Acids*, and ſo can make no *Ferment* with this *Compound Spirit*, which is it ſelf highly *Acid*.

Having now made it plain and eaſie for any one to make two Liquors, actually Cold, without any adventitious *Heat* or *Fire*, boyl up to *Flame*, it will ſeem ſtrange that after ſo many Experiments made in the World by all ſorts of *Chymiſts*, and with all manner of Fermenting and *Fiery* Ingredients, none ſhould have diſcovered a Certain way of producing this Great and Deſireable Effect. For though I will not queſtion the Veracity of the great *Borichius*, who declares to the World, that he made his *Oyl* of *Turpentine* and *Spirit* of *Nitre* to take *Fire* and *Flame*; yet for my part, after ſo many unſucceſsful Experiments made with the greateſt Accuracy I could, I muſt ſtill own my Incapacity to perform it: But if you add ſome drops *Vid. Sup. Sect. XVII.*

of *Balſam* of *Sulphur* to that *Oyl* of *Turpentine*, the Effect will then very Certainly ſucceed, and your Mixture advance to an Actual *Flame*.

Exploſion *and* Accenſion *made in* Vacuo. *ib. p.* 212.

I ſhall venture here to add one ſurprizing Effect of this *Fiery* Mixture, which was done in the preſence of ſeveral Spectators.

We took *half* a *Dram* of the *Oyl* of *Carvi-Seeds*, and poured it into a little Gally-Pot, and placed over it a Glaſs that held 3 Pints, upon Monſieur *Papin's Exhauſting Engine*, and having ſoon Cleared it of the *Air*, we turned up the Vial in Order to ſee what Effect would enſue, in this ſort of *Vacuum*, upon this Mixture: But in the twinkling of an Eye the *Receiver* was *Blown up*, and the Mixture in a *Flame*; which Stupendious Phænomenon Surpized and Frightned us all. Nor did I ever ſee or hear of the like by any Mixtures made *in Vacuo*, though I have my ſelf ſeen a Thouſand. For if we look into theſe many and admirable Experiments made by the Immortal Mr. *Boyle*, the Removal of the *Air* did almoſt always extinguiſh *Light*, and *Fire*, and *Flame*.

The *Blowing up* of the Glaſs does alſo make the Experiment the more Aſtoniſhing, and Puzzles one how to account for ſo great a quantity of *Air* as was produced from theſe Liquors, which amounted only to a *Dram* and *half*; for here was required not only *Air* enough to fill up the Capacity of the Veſſel, but alſo there was required ſo great a Preſſure within as did exceed that great incumbent Weight of the Air that preſſed upon this capacious Glaſs without, (whoſe Diameter was 6 *Inches*, and the Depth above 8); for otherways it would not have thrown it up into the *Air*.

If we Review and conſider well the Phænomena of this Experiment, we may find the Reſiſtance of ſome Hundred Weight that was countervailed; and not only ſo, but with a much Greater Force *Exploded*.

That it was not produced by any Expanſion of the common *Air*, for that was ſeen to Riſe out of the Liquors themſelves, and was drawn out of them in their Separate State by the *Exhauſting Engine*, which ſuffers no *Elaſtical Air* to lye concealed in any Liquors.

That it was produced in an Inſtant, by the mutual Colliſion and Agitation of theſe Active and ſelf-expanding Liquors.

That it was not abſolutely Generated *de Novo*, but that the *Air* was Antecedently there, we may reaſonably believe, although in a very Differing State from what it is in, when *in Pleno*. For all that the *Exhauſting Engine* does is to deliver the *Air* from a State of Compreſſion, by leaving it to ſtretch it ſelf like a Bladder, that has full Liberty to ſwell up, and has no Hard Body to ſtreighten or oppoſe its Expanſion: So that we have cauſe to conclude our Liquors to be furniſhed with this ſort of *Air*, which, being by the *Accenſion* of theſe two Liquors put to a new and Violent Motion, do expand themſelves, *de Novo*, and to that Degtee, as to anſwer ſo great an Effect as is above mentioned.

5. The Circumſtance of which Phænomenon will allow me to call this Mixture a ſort of *Liquid Gun-powder*; which brings me to make a Compariſon betwixt *Gun-powder* and the *Fiery Mixture*.

These *Phænomena* Agree, in that both do *Heat*, and *Burn*, and *Flame*; and also do considerably Resist and Raise up Bodies that do Oppose them. In both, the *Air* is much Agitated and *Expanded*: For in *Gun-powder* you have much *Air* Coil'd up and Included in Particles of *Nitre*, which the *Brimstone* and *Charcoal* by their sudden *Accension* do violently Expand and Swell to that Degree, that like a storm of Wind it bears every Heavy and Resisting Body before it, especially when it is Compressed or Restrained within just bounds.

A Comparison betwixt Gun-powder and this Fiery Mixture. ib. p. 213.

The Experiment just above-mentioned can only Account for that *Explosion* by charging it to some little concealed *Air* our *Fiery Mixture* Expanded; in so much that I doubt not, that if a way were invented (which seems to me not impracticable) to make it go off as *Powder* does out of a *Gun*, it would *Project* a Heavy Body a great way.

We further made an Experiment *in Pleno*, or after this manner.

We put a small Quantity of the *Oyl* in a Gally-Pot, and some of the *Spirit* in an Open Glass, and fixed a Plate of Copper upon the Gally-Pot, so as to cover it pretty exactly, and then set a Weight upon the Plate, and pulling a String, made the *Spirit* to Mix with the *Oyl*, which did at that Instant *Blow up* the Cover, and throw off the *Weight*.

But though it doth in some respects agree with *Gun-powder*, yet in others you see a great Disparity: For *Gun-powder* will not be made to take *Fire*, or make any *Explosion in Vacuo*, both which this Mixture performed with the same Celerity it did in the *Air*.

Vid. Par. II. Cap. I. Sect. LXXIX. 3.

Gun powder is a Composition of the most *Dry* and Combustible Materials we can pack together; in our Mixture of two *Fluids*, one of them is not easily made to *Burn* by it self, and the other will Extinguish Common *Fire*.

Gun powder requires Actual *Fire* to bring it to an *Accension*, whereas in this you have only two Waters or Liquors, both *Cold* to the touch that do produce *Fire* and *Flame* by the bare Joyning and Mixing them together.

And now we will conclude this Experiment, only taking Notice of the *Caput Mortuum*, (as *Chymists* call it) or of what remains after the *Accension* is over; which seems to be something uncommon.

In case you have adjusted the Proportion of *Spirit* to the *Oils* exactly well, you will not fail to make the Mixture *Flame*: And upon the *Extinction* of the *Flame* you will have a Light and Blackish Substance, which will indeed vary both as to the Bulk and Complexion, according to the Difference of the *Oyls*. But in this they all Agree, namely, to leave behind a Spungy and exceeding Light Matter, and perfectly *Insipid*. Sometimes it swells up into a great Protuberance, as big as a Man's Fist above the Gally-Pot; and if you *Taste* it (which you may safely do) and Macerate it in your Mouth, you will find it to be as *Tastless* as Paper, or even Paper when burnt to Ashes. In so much that we may safely conclude that by this Powerful Mixture a 3d *Solid* Body Results, absolutely differing from either of the two mentioned *Liquors*: And which makes it the more Remarkable, that both these *Fluids*, which have so great an Impression upon the Organs of *Smell*, and a very

great

great one on the Organs of *Taſt*, ſhould in an Inſtant be Deſtroyed, and Terminate in a *Dry Inſipid Caput Mortuum*, which will not Melt in the *Air*, nor be Diſſolved by *Water*, nor other Corroſive *Menſtruums*, but Remains as much a *Caput Mortuum*, as a piece of Paper, or a Rag Burnt to Aſhes, if not much more.

Upon a Review of the whole, this Experiment will poſſibly not only Surprize and Amuſe ſome, but Pleaſe and Delight others; and not only ſo, but perhaps afford ſome Inſtruction to a Philoſophical Genius. By this the Power of *Motion*, in order to the Producing thoſe great Effects of *Heat*, *Fire*, *Flame*, and *Light*, may be conſidered; the Natures of *Oyls* ſomewhat Examin'd and Extinguiſh'd; the Productions of new Bodies by the Power of Mixture Repreſented; and I hope in time ſome Mechanical Uſe made of it, at leaſt its heartily wiſhed ſo.

R. S. *Vid. Sup. Sect.* XVII.

Mr. *Molt*, a moſt Ingenious Chymiſt, and deſervedly a *Fellow* of the *R. Society* (to whom I muſt acknowledge an Obligation for the liberal uſe he allowed me of his great and excellent Collection of *Eſſential Oyls*) Affirms to me, that he hath ſometimes made *Oyl* of *Turpentine* take *Fire*: but yet it proves ſo hard a matter to bring it to an *Accenſion*, that he is always doubtful of the Succeſs.

I know that if a *Candle* be brought any thing near the *Smoak*, raiſed by this Mixture, then the *Oyl* will certainly take *Fire* from the *Flame* of the *Candle*. Not but that I am glad of this or any Oportunity to do juſtice to the Memory of the Famous *Borichius*, who has Printed an Experiment of this ſort in the *Acta Hafnienſia*.

Mr. *Molt* did alſo inform me, that *Spirit* of *Wine* would give a *Flaſh* of *Light* with this *Compound Spirit*, but not *Burn*; and he has obſerved the ſame Circumſtance in his Experiment, which I did formerly (in the Year 1683.) That if you put your *Spirit* of *Wine* to that of *Nitre*, you will have a great *Effervеſcence* immediately enſue; but if you invert the Order, and put the *Spirit* of *Nitre* on the *Spirit* of *Wine*, you will not have any *Ebullition* for ſome time: But this Circumſtance is quite contrary to all the other Experiments we have made about the *Oyls*.

That the *Spirit* of *Wine* does not take *Fire*, ſeems to Proceed from the ſame Impediment, which hinders *Light Oyls* from coming up to an *Accenſion*, becauſe they are ſo ſuddenly thrown off; and there ſeems to be a great Analogy betwixt *Æthereal Oyls* and the *Spirit* of *Wine*, both as to *Specifick Gravity*, and as to other Properties; *Spirit* of *Wine* ſeems to be a more Thin and Diluted *Eſſential Oyl*, that contains ſome *Water* and more *Air* in its Pores; they ſeem to own the ſame Material Cauſe: For if you Diſtil an *Eſſential Oyl* out of any *Seed*, you ſhall not then be able to Produce any *Spirit*, and *Vice Verſa*, if you Diſtil of the *Spirit* firſt, no *Oyl* will follow. There is alſo a great Affinity in Texture; for the *Spirit* and *Oyl* do eaſily Unite and Mix together, eſpecially if the *Spirit* be highly *Rectify'd*, and have leſs of *Water* or other Heterogeneous Matter in it; as any one may find, if he will take the Pains to Shake a true *Eſſential Oyl* with *Spirit* of *Wine*, a good proportion of the former will Incorporate with the Latter.

XIX. I have found a *Sulphureous Spirit*, which being mixt with a *Volatile Alkali*, ſuch as *Spirit* of *Sal Armoniack*, or *Urine*, &c. gave it a *Red Colour* in a Moment. I make the *Spirit* by *Diſtilling* 2 or 3 Pound of *Benzoin* with a little Sand in a *Retort*, *ad Siccitatem*, and put the *Oyl*, *Spirit* and *Flowers* altogether into a Paper *Filtre*, and the *Spirit* comes *firſt* thro'. You may put 2 parts of this *Spirit* to *one* of *Spirit* of *Sal Armoniack*, and ſhake the Glaſs or Bottle and it will be *Red* in a Moment, though both the Liquors were clear before; and the more the Glaſs is ſhaken the Deeper or Blacker *Red* it will be. It produces this Effect without any *Effervеſcence*: This Experiment may perhaps be ſerviceable in the demonſtrating of *Sanguification.*

A Clear Sulphureous Spirit, which being mixt with a Volatile Alkali *gives a* Red Colour; *by Mr.* Edw. Coles, *n.* 228. *p.* 542.

XX. To make the *firſt* of theſe Liquors, put a ſmall Handful of *Dryed Red Roſes* into a Glaſs Bottle, pour on them *Rectify'd Spirit* of *Wine* till it cover them an Inch. Let them Infuſe in the Cold all together in the Bottle for 4 or 5 Hours, then Pour off the *Spirit* of *Wine*, which will be *Clear* and have No Colour.

This *Second* Liquor is made by putting into ſome good *Spirit* of *Wine* ſome Drops of good *Spirit* of *Vitriol*, or *Oyl* of *Sulphur*, ſo that ſcarce can the *Acid* or Souer be diſcover'd by the Tongue.

If you put a little of this *Laſt* Liquor into the *Firſt*, it will give a Fine *Reddiſh Colour* without any *Effervеſcence* or other ſenſible Alteration.

If inſtead of this *Wine* mixed with *Acids*, you put to the *Firſt* ſome Drops of any *Volatile Alkalies*, as of *Spirit* of *Sal Armoniack*, or other, it will give a *Green Colour* to the Infuſion.

Two Clear Inflammable *Liquors which being Mixt give a* Carnation Colour; *by M.* Geoffroy, *n.* 249. *p.* 43.

XXI. An Ingenious Teacher of *Mathematicks*, having occaſion to make a Compoſition for a new *Fire-Engine*, whereof he was to ſhew his Majeſty a Tryal, Mingled divers Ingredients in an Earthen Pot, over kindled Coals; but could not, or did not, do it ſo warily, but that the Matter took Fire, and began to Blaze furiouſly; which obliged him to ſtiffle the Flame as haſtily as he cou'd: And having remov'd the Veſſel from the Fire, and ſuffered it to grow Cold, when afterwards he came to look upon it, to ſee if what remain'd might be of any uſe to him, he was ſurpriz'd to find it Variouſly and Briskly *Moved.* Wherefore having ſet it aſide, and to be ſure that it might be thoroughly Cold, he after ſome Hours viſited it again, and found it *Move* as before. And having caſt ſtore of Seeds upon it, to ſee if the Liquor would Move them alſo, the Bituminous part of it connected them into a kind of thick Scum, that covered moſt of the Superficies; but yet left ſome Intervals, in which the Liquor appear'd, and Diſcover'd that it continu'd its *Motions.* Two Days after, the Engineer diſcourſing with me of his *Fire-Work*, about which he had advis'd with me before; told me among other things, of this Odd Accident. And when I had ask'd him, if the *Motion* continu'd ſtill, and had been anſwer'd affirmatively,

A ſtrangely Self-moving *Liquor*; *by Mr.* Robert Boyle. *n.* 176. *p.* 1188.

tively; my Diffidence or my Curiosity made me engage him to send for the Pot as it was; partly to be sure of the Matter of Fact, and partly to try, if the knowledge I had of the Ingredients, which he had before told me, would afford any Hint of the Cause of so Odd an Effect; a like to which in Kind, tho not in Degree, I had many Years before Devis'd, and successfully Practis'd the way of Producing.

The Vessel being come, there did appear manifest Signs of such a *Motion* as the Engineer had ascribed to it; and therefore I caused it to be set aside in a *Laboratory*, where some *Furnaces* kept the Air constantly Warm, and did there and elsewhere, at distant times, look heedfully upon it, now and then displacing, or quite taking off some of the thick Scum, that too much covered the Surface of it; and by this means I had the Opportunity to take notice of several Phænomena, whereof these are the chief.

1. I observed, that the *Motion* of this Liquor was not only Brisk, but very Various; so that having loosened some small portions of the Scum from the rest, one of them would be carried towards the Right hand for Instance, and another towards the Left, at the same time. 2. Where the Liquor came out first from under the Scum, it seemed to move the most briskly, flowing almost like a Stream, whose *Motion* upwards had been checked, and as it were Reverberated, by that incumbent Obstacle. 3. Several *Motions* in this Liquor were the more easy to be observed; because tho' it were Dark, yet it was not Uniform, consisting in part of *Oily* and *Bituminous* Ingredients, which though they seemed to have but one common Superficies with the rest of the Liquor, yet by their Colours and Power of vigorously Reflecting the Light, they were easily enough Distinguishable from the rest. And I often observed, that some of the *Unctious* Portions of the matter, Emerging to the Surface of the Liquor, tho' perhaps at first one of them would not appear bigger than a Pin's head; yet in the *Moving* forwards it would at the same time *Diffuse* it self Circularly, and make as it were a great *Halo*, adorned with the *Colours* of the *Rain-bow*, and so very Vivid as afforded a very Pleasant, and at first Surprizing, Spectacle; these Phantasms often nimbly succeeded one another, and lasting till they lost themselves against or under the thick Scum. 4. The *Motions* of this odd Liquor were not only various, but frequently *Vortical*; to be satisfied of which I sometimes put short bits of Straw, or Fragments of some such like Stuff, upon the Discovered part of the Surface of the Liquor, by which they were carried towards very distant, if not opposite parts of the Vessel at the same time. But to make the *Vortical Motion* more evident, I several times detached considerably large pieces of the thick Scum from the rest of the Body: and had the pleasure to see them *Move* both with a Progressive *Motion* in Crooked Lines, and with a *Motion* about their own Middlemost parts. All this while the Liquor, whose parts were thus briskly *Mov'd*, was actually *Cold* as to Sense. 5. To Observe what the Presence or Absence, of the *Free Air* would do to this Liquor; I caused many Spoonfuls of it, with some of the Scum, to be put into a Cylindrical Glass, which tho' large it self, had a neck belonging to it, that was but about the bigness of ones Thumb, that it might be well stopt with a Cork.

But

But having by this means kept the *Free Air* from having a full and immediate Contact with the whole Surface of the Mixture, as it had when that Mixture lay in the Wide-Mouth'd Veſſel; I could not perceive the Liquor to *Move* to and fro, no not though the Orifice of the Neck were left open: whereas having at the ſame time pour'd ſome of the Liquor into a very Shallow and Wide-mouth'd Veſſel, call'd in the Shops, a clear cak'd Glaſs, it *Moved* rather more than leſs Nimbly and Variouſly than in the great Earthen Pot, (which yet was of the ſame Shape,) and ſhewed us many of thoſe *Vivid* and *Self-dilating Circles*. 6. Tho' the *Motions* of the Liquor did not ſeem to be always Equally Brisk, yet they appeared to continue Manifeſt and Various in ſome Diverſities of *Weather*, as to *Cold* and *Heat*; and when I lookt on it by the Candle Light, as well as by Day Light.

I kept ſome Spoonfulls of this Liquor cloſe ſtopt in a Vial, and by this means I had the Opportunity to obſerve, that when I pour'd out the Liquor into a Wide-mouthed Veſſel it would *Move* as before, tho' this were done ſome *Weeks* after it had been put up. About the beginning of *June*, that is about five *Months*, or more, after the Liquor was firſt obſerved to *Move*, to Gratify the Curioſity of a *Foreign Miniſter*, and that of ſome other Ingenious Men then preſent, I caus'd the Vial to be brought, and having unſtopt it, I pour'd out the Liquor in a conveniently ſhap'd Veſſel; in which after we had ſuffered it to reſt a while, they were delightfully ſurprized to ſee it *Move* (tho' not in my Opinion quite ſo Briskly as before, yet) very Manifeſtly and Variouſly. This incouraged me to think it poſſible, that it might retain ſome *Motion*, tho' but Languid, 7 or 8 *Weeks* after, and therefore on the 25 of *July*, I looked upon it again; and having cauſed it to be pour'd into a China Cup, it Manifeſted at firſt a Brisk and Various *Motion*. But this after a while did ſo ſlacken, that I began to have ſome *Suſpicion*, that the *Motion* it was put into by Effuſion, and the firſt Contact of the *Air*, might have given it the greateſt part of its Agitation; but this was only *Suſpicion*.

XXII. *A Paper of leſs General Uſe* Omitted. *viz.*

A Factitious ſtony matter or Paſte, *ſhining* in the *Dark* like a Glowing Coal, after it hath been a little while expoſed to the *Day* or *Candle Light*; Invented by *Chriſt. Adolphus Balduinus*, and Preſented by him to the *King*, and to the *Royal Society*. *n.* 131. *p.* 788.

XXIII. *Accounts of Books*, Omitted.

1. PHarmacologia, ſeu Manuductio ad *Materiam Medicam*; in qua Medicamenta *Officinalia* Simplicia, hoc eſt *Mineralia*, *Vegetabilia*, *Animalia*, eorumque Partes, in Medicina Officinis uſitata, in Methodum naturalem Digeſta ſuccinctè & accuratè Deſcribuntur, cum Notis Generum Characteriſticis, Specierum Synonymis, Differentiis & viribus. à *Sam. Dale*. *n.* 204. *p.* 925.

n. 192. p. 488. 2. *Medicina Hydroſtatica*, or *Hydroſtaticks* applied to the *Materia Medica*; ſhewing how by the Weight that divers Bodies uſed in *Phyſick* have in Water, one may diſcover whether they be *Genuine* or *Adulterate*. By the Honourable *Rob. Boyle. London.* 1690. in 8*vo.*

n. 76. p. 2287. 3. *Dan. Ludovici*, Medici *Ducal. Saxo-Gothani*, de *Pharmacia* Moderno Seculo applicanda, Diſſertationes Tres. *Gothæ.* 1671. *in* 12*o.*

n. 60. p. 4087. 4. *Hermanni Grube.* M. D. Commentaius de Modo *Simplicium Medicamentorum* Facultates Cognoſcendi. *Hafn.* 1669. *in* 8*vo.*

n. 85. p. 5023. 5. A Rational way of Preparing *Animals*, *Vegetables*, and *Minerals*, for a *Phyſical* Uſe; by *Edw. Bolneſt.* Med. Reg. Ord. *Lond.* 1672. *in* 12*o.*

n. 75. p. 1176. 6. *Pharmacopœia Regia*, ſive *Diſpenſatorium* Novum Locupletatum & Abſolutum, cum annexa Mantiſſa *Syagyrica*, & Gemino Diſcurſu Apologetico contra *Ott. Tachenium*, & *Franc.* Vernis. Auth. *Joh. Zwelfer.* M. D. 1668. in *Fol.*

n. 123. p. 709. 7. *Pharmacopee Royale, Galenique & Chymique*, par *Moyſe Charas.* à *Paris.* 1676. *in* 4*to.*

8. The *Royal Pharmacopœa, Galeno-Chymical*, according to the Practice of the moſt Eminent and Learned Phyſitians of *France*, and publiſhed with their ſeveral Approbations; By *Moſes Charas.* In *Engliſh.*

n. 133. p. 835. 9. *Pharmacopœia Collegii Regalis. Lond.* 1677. in *Fol.*

n. 206. p. 1000. 10. *Pharmacopœia Bateana:* or, *Bate's Diſpenſatory*, Tranſlated into *Engliſh*; by *Will. Salmon. Lond.* 1694. *in* 8*vo.*

n. 264. p. 612. 11. *Pharmacopœia Harlemenſis*, Senatus Authoritate munita. *Harlemi.* 1693. *in* 12*o.*

n. 52. p. 1058. 12. Hiſtoire Naturelle des *Animaux, Plantes*, & *Mineraux*, qui entrent dans la Compoſition de la *Theriaque* D' *Andromachus*; par *M. Charas.* A *Paris. in* 12*o.*

n. 74. p. 2237. 13. De *Laudano Opiato*, Auth. *Matth. Tillingio.* M. D. *Francofurti.* 1671. *in* 8*vo.*

n. 99. p. 6166. 14. *Pharmaceutice Rationalis*, ſive Diatriba de *Medicamentorum Operationibus* in Humano Corpore: Auth. *Tho. Willis.* M. D. *Oxon.* 1673. *in* 4*to.*

n. 39. p. 779. 15. *Olai Borrichii*, Med. Reg. de Ortu & Progreſſu *Chemiæ* Diſſertatio *Hafniæ.* 1668. *in* 12*o.*

n. 50. p. 1019. 16. *Ottonis Tachenii Hippocrates Chymicus. Venetiis. in* 12*o.*

n. 135. p. 886. 17. A New Treatiſe of *Chymiſtry*, &c. Written in *French*, by *Chriſt. Glaſſer*: and now faithfully *Engliſhed*, by *F. R. S. Lond.* 1677. *in* 8*vo.*

n. 175. p. 1183. 18. A Courſe of *Chymiſtry*; by *Nich. Lemery.* M. D. Tranſlated from the French, by *Walter Harris.* M. D. *Lond.* 1686.

n. 175. p. 1186. 19. *Officina Chymica Londinenſis.* Opera & Studio *Nicolai Staphorſt. Lond.* 1685. *in* 12*o.*

n. 136. p. 920. 20. The Curious *Diſtillatory*, *&c.* Written Originally in *Latin*, by *Joh. Sigiſm. Elſholt*: and *Engliſhed*, by *T. S.* M. D. *Lond.* 1677. *in* 12*o.*

n. 29. p. 555. 21. Synopſis *Novæ Philoſophiæ* & *Medicinæ*, *Franciſci Travagini.* Medici *Veneti.*

22. *Herme-*

22. *Hermetis Ægyptiorum* & *Chemicorum* Sapientia, ab *Hermanni Conringii* Animadverſionibus vindicata; per *Olaum Borrichium*; *Hafniæ*. 1674. in 4o. *n.* 113. *p.* 296

23. *Davidis van der Beck, Mindani*, Experimenta & Meditationes circa Naturalium Rerum *Principia*, &c. *Hamburgi*. 1674. in 8o. *n.* 103. *p.* 60.

24. Epiſtola ad D. *Joelem Langelotum*, de *Alcali* & *Acidi* Inſufficientiâ ad gerendum Munus *Principiorum* Corporum Naturalium: Conſcripta à *Joh. Bohn*. M. D. *Lipſiæ*. 1675. in 8o. *n.* 117. *p.* 407. *n.* 145. *p.* 110

25. *Zymologia Chymica*, or a Philoſophical Diſcourſe of *Fermentation*, from a new Hypotheſis of *Acidum* and *Sulphur*; with an additional Diſcourſe of the *Sulphur Bath* at *Knarſbrough*: by *W. Sympſon*. M. D. *Lond*. 1675. in 8o. *n.* 117. *p.* 410.

26. Philoſophical Dialogues concerning the *Principles* of Natural Bodies; by *W. Simpſon*. M. D. *Lond*. 1677. *n.* 135. *p.* 883.

27. De Figuris *Salium*; by S. *Redi*. *n.* 8. *p.* 145.

28. *Georgii Wedelii*. M. D. Specimen Experimenti novi, de *Sale Volatili Plantarum*. *Francofurti*. 1672. in 12o. *n.* 100. *p.* 7000.

29. Tractatus 5. Phyſico-Medici de *Sale-Nitro* & *Spiritu Nitro-Aereo*, &c. Auth. *Joh. Mayow*. L. L. D. *Oxon* 1674. in 8o. *n.* 105. *p.* 101.

30. *Jac. Barneri*, D. *Spiritus Vini* ſine *Acido*, &c. Demonſtratio Curioſa. *n.* 145. *p.* 111.

31. The *Chymical Touchſtone* of M. *Joh. Kunkle*. De *Acido* & *Urinoſo Sale* Calido & Frigido, contra Doctor. *Voights Spir. Vini* Vindicatum. *Berlin*. 1684. *n.* 168. *p.* 896.

32. Tractatus de *Salis Cathartici Amari* in Aquis *Ebeſhamenſibus* & hujuſmodi aliis contenti Naturâ & Uſu. Auth. *Neh. Grew*. M. D. *Lond*. 1695. in 12o. *n.* 216. *p.* 76.

33. Il *Fosforo*, overo la *Pietra Bologneſe* Preparata per reluvere fra l'ombre Fatica di *Marc. Antonio Cellio*. In *Roma*. 1680. *Phil. Col. n.* 3. *p.* 77.

34. Diſſertatione Epiſtolare del *Fosforo Minerale* oſia della *Pietra Illuminabile Bologneſe*, à Sapienti ed Eruditi Signori *Collettori* degli *Acta Eruditorum* di *Lipſia*, Scritta da *Luigi Ferdinando Conte Marſigli*, &c. *Lipſ*. 1698: in 4o. *n.* 243. *p.* 306.

FINIS.

THE Philological and Miscellaneous Papers, PUBLISH'D and DISPERS'D IN THE Philosophical Transactions AND COLLECTIONS ABRIDG'D AND Disposed under GENERAL HEADS.

CHAP. I.

PHILOLOGY.

Grammar.

I. HAving observ'd a great Difficulty in truly *writing* what is Pronounced, or truly *Pronouncing* what is Written, either in Our own or Foreign Languages, by the ordinary *Alphabets* now in use, arising either from the Want of some Letters, or the Differing Pronunciation of the same Character or Letters in differing Languages, and the Irregularities of its various Sounds in any one Language, I saw a Necessity of some such Expedient as I have here attempted, *viz.* An *Universal Alphabet*, which should contain an Enumeration of all such Single Sounds or Letters as are used

An Essay towards an Universal Alphabet; *by Mr.* Lodwick. *n.* 182. *p.* 126.

uſed in any Language. By the help of ſuch a Collection being perfect, 1. Children from their firſt beginning, being Taught and Accuſtomed to the true Expreſſion of all theſe ſingle Sounds or Letters, will without difficulty be brought to *Pronounce* truly and readily any Language. 2. Any one Accuſtomed to the true *Pronunciation* of this *Alphabet* will be enabled to *Deſcribe* the *Pronunciation* of any Language whatever, that ſhall in his Hearing be diſtinctly Pronounced; ſo as another alſo Accuſtomed to this *Alphabet*, altho' he before never had Heard this Language Pronounced, ſhall notwithſtanding at firſt Sight of ſuch *Writing*, be able ſo truly to Pronounce it, that it ſhall (if at all) very little Differ from the Original Pronunciation. 3. This *Alphabet* will alſo be uſeful to *Perpetuate* the true Sounds of any Language, and ſerve as a Standard thereof to After-Ages: For if all the Single Sounds expreſſible be here *Characteriz'd*; and that no One *Character* have more than One *Sound*, nor any one *Sound* be Expreſſed by more than one *Character*; it cannot fall out that any *Character* ſhould be *Falſly Pronounced*, but it will ſoon be Diſcover'd; for this *Falſe Sound* he giveth it, muſt be the *True Sound* of ſome other *Letter* of this *Alphabet*.

In this Collection I proceed according to theſe Rules. 1. That no True *Single* Sound can be truly Deſcrib'd or expreſs'd by the Conjunction of any Two or more other Single Sounds; *Viz.* If a *Vowel*, by the Conjunction of other *Single Vowels*, or if a *Conſonant*, by the Conjunction of other *Single Conſonants*.

2. That whatever Sound cannot be Expreſs'd or Deſcrib'd, but by the Conjunction of two or more Single Sounds, is no *Single* but a *Compounded Sound*.

3. That in every *Compoſition* of *Single Sounds*, the particular Single Sounds which make up that Compoſition, ought to be Truly and clearly Diſcern'd in the *Sound* of the *Compoſition*, otherwiſe it cannot truly be ſaid to be a *Compoſition*, and Compoſed of ſuch *Single Sounds*.

The *Single Sounds*, uſually nam'd *Letters*, are commonly Diſtinguiſh'd into *Vowels* and *Conſonants*. *Vowels* are ſuch as are *Singly* expreſſible, as *a*, *e*, *i*, *o*, &c. *Conſonants* are ſuch as cannot *Singly* be expreſs'd without the Conjunction of a *Vowel*, as *b*, *d*, *f*, *g*, &c.

The whole Number of *Vowels* are theſe 14 following; to which for the better diſcerning of their *Sounds*, I have annex'd ſo many Words wherein they are Expreſs'd, all *Engliſh* but 3, *viz.* 7, 8, 12. becauſe no *Engliſh* Words occurred to my Memory, wherein they are expreſt.

1	a *as*	Tall	5	ea	Teal	9	y	Tile	13	oo	Tool
2	a	Tallow	6	i	Till.	10	o	Tone	14	ou	Could
3	a	Tale	7	u	Dure *French.*	11	u	Tunne			
4	e	Tell	8	ui	Muis *Low-Dutch.*	12	u	Une *French*			

Theſe are the *Vowels*, each of which are *Long* and *Short*: *Short* as in the Words, *God*, *Man*, *Sin*; *Long* as in *Ball*, *Demand*, *Seen*, &c.

A *Diphthong*, in the ordinary uſe of the Word, ſignifies a Compound of *Two Vowels*: but thoſe in Ordinary ſo nam'd, are moſt of them nothing but only

only *Single Vowels*, as *ea*, *oo*, *eo*, *ai*, in the Words, *Teal*, *Fool*, *Could*, *People*, *Main*, &c. That these are but *Single Sounds*, will appear if we consider the Sounds of the *Vowels Singly*, that make those supposed Compositions, and then whether those Sounds in Composition will make out the True Sound requir'd; so as both of them may be *Clearly Discern'd* in these pretended *Compounds*. For instance, in *ea* in *Teal*; Consider the Sound of *e* in the Word *Sent*, or in the Word *Scene*; and *a* in the Word *Ball*, or in the Word *And*, or in the Word *Tale*, and then whether *e*, in either of the Two Sounds going before, and *a* in either of the Three Sounds following, joyn'd together, will make out the True Sound of *ea* in the Word *Teal*: If not, then is it a *Single Sound*. Thus if you proceed to examine all the other, you will, I doubt not, find the same Event, and I believe the True *Diphthongs* and *Triphthongs* of the *Greeks* were no other, but a true Expression of the *Single Vowels* they joyn'd together, but in so short a Time, as both or all 3 were Express'd in the Time that ordinarily one Single Vowel was expressed.

The whole number of *Consonants* are these under-mention'd, as nigh as I could Collect by Examining all the Languages I am acquainted with, or have heard Expressed: And I think but few, if any *Single Consonants* have escap'd my Notice, all which in this following Table I have ranged in 11 *Files* and 6 *Ranks*.

	1	2	3	4	5	6
1	B. Bond.	D. Dark.	J. Jest.	G. Game.	=	=
2	P. Pond.	T. Tart.	Ch. Chest.	K. Came.	=	=
3	M. Mind.	N. Name.	gn. Seignior. } *Fr.*	ng. Song.	=	=
4	=	dh. This.	J. Jean. } *Fr.*	g. Gaen. } *L. D.*	V. Valley.	Z. Zeal.
5	=	th. Thing.	sh. Shall	ch. Dach. } *L. D.*	Folley.	S. Seal.
6		n. Danse. *Fr.*				

	7	8	9	10	11	
1	L. Lane.	H. Hand.	Y. Yarn.	R. Rand.	W. Wand.	*Fr.* signifies *French*.
2						*L. D. Lowdutch*.
3						*W. Welch*.
4						
5	lh. *W.*					
6						

The *First File* contains 3 *Consonants*, the *Second* 6, the *Third* and *Fourth* 10, the *Fifth* and *Sixth* 4, the *Seventh* 2, the remaining *four* each one, in all 29 *Consonants*.

The *Second Rank* in each *File* contains *Derivatives* [so I shall name them] in relation to the *First Rank*, or their *Primitives*, all alike in Kind; so also all the *Derivatives* in the 3*d*, 4th and 5*th Ranks*, whereby their Sounds will be comprehended.

Those

Thoſe places fill'd with Two Strokes (=) Signifie that *Sounds* may be Expreſs'd by the ſame *Poſture* of the *Mouth* with their *Primitives*, anſwering in Kind to thoſe in the ſame *Rank* wherein they ſtand: but they would be ſo like in *Pronunciation* to ſome others in the Table, that the Difference would be too Nice for common Diſcernment, and alſo for that I have not obſerv'd them uſed in any Language I have heard expreſſed by a Perfect Mouth, I thought it needleſs to Characterize them.

As thoſe of the 4*th* and 5*th Rank* in the *Firſt File* are like thoſe of the 4*th* and 5*th Rank* in the 5*th File*, and thoſe of the 1*ſt*, 2*d* and 3*d Ranks* in the 5*th File*, are like thoſe of the ſame *Ranks* in the *Firſt File*, ſo thoſe of the 1*ſt*, 2*d*, 3*d*, *Ranks* in the 6*th File*, are like thoſe of the ſame *Ranks* in the *Second File*.

Some of theſe above-mention'd 29 *Single Conſonants*, are vulgarly ſuppoſed *Compounded*, as *th*, *ch*, *ſh*, *gn*, *ng*, &c. But if you conſider the Sound of each *Single Conſonant* in the Compoſition apart, and then the *Conjunction* of them in that Order, ſo as the *Single Sounds* may be clearly Diſcern'd in the Compoſition, you will never make the *Sounds* required: and if neither by this nor by any other *Conjunction* the Requir'd *Sound* can be made out, it muſt be a *Single* and no *Compound Sound*.

All *Single Sounds* ought to have *Single* and *Diſtinct Characters*: But it will be impoſſible in the Uſe of the Preſent *Characters* or *Alphabets*, to Add thoſe Wanting, and to Correct and Limit the Sound of others in Uſe, Thereby to conſtitute a *Perfect Alphabet*, becauſe People ſo long Accuſtom'd or Habituated to the Corrupt and Differing Expreſſions of the Preſent *Characters*, will be always Subject on the Sight of the Old, to give them thoſe *Sounds* they have been uſed to, and to *Spell* Words according to their Old and Corrupt Cuſtom, whatſoever Rules ſhall be ſet to the contrary. I have therefore in the following *Table* given a New Set of *Literal Characters*, both *Conſonantal* and *Vocal*. The Set of *Conſonantal* are Rang'd in the ſame Method and Order with thoſe in the fore-going Table. The *Firſt Rank* in every *File* are thoſe I name *Radical Characters*; the other ſucceeding *Ranks* have each a diſtinct *Characteriſtical* Addition to Diſtinguiſh them one from another, which cauſeth ſome Complication: but yet I judg'd it neceſſary to expreſs the ſame in the *Character*, the more regularly to Sort them into Claſſes, and to Expreſs the *Derivation* of *Letters* of the ſame *Organ*, the one from the other.

The Set of *Vocal Characters* is likewiſe in the ſame Table. In Writing they are to be placed over the *Conſonants*, which they follow in Expreſſion; and whereas ſome *Syllables* begin with a *Vowel*, place the 12*th Conſonantal Character* anſwering to the *Hebrew Aleph*, and over the ſame place the *Vowel* beginning ſuch a *Syllable*. To Diſtinguiſh the *Long Vowel* from the *Short*, add a Prick to the *Vocal Character*. The 9, 11, 12, 13, 14*th Vocal Characters*, are for want of Single Strokes) Compounded of the *Firſt* and 2*d*. The *Diphthongs*, Truly ſuch (as I have before noted) may be made by the Conjunction of the *Single Vocal Characters* in order as they follow, and will be eaſily Diſtinguiſh'd from the 5 fore-going *Compounded Characters* of

the

the *Single Vowels*, becauſe there will not likely Occur any *Diphthongue*, Compounded of the *Firſt* 2 *Vowels*.

The *Accent* may be a Thwart Line under the *Syllable* that is to be *Accented*. The 4 Marks of *Pauſes* ordinarily uſed, namely , ; : . may be continu'd. The *Characters* ſignifying the Various *Modes* of *Expreſſion* may be theſe following, and ought to be placed at the Beginning and End of every Sentence requiring it. [ ] *Explications.* ( ) *Parenthesis.* ¡ ¡ *Emphaſis* ¿ ¿ *Interrogation.* ! ! *Wonder.* ¿ ¿ *Irony.*

The Univerſall Alphabet.

The Table of Conſonants

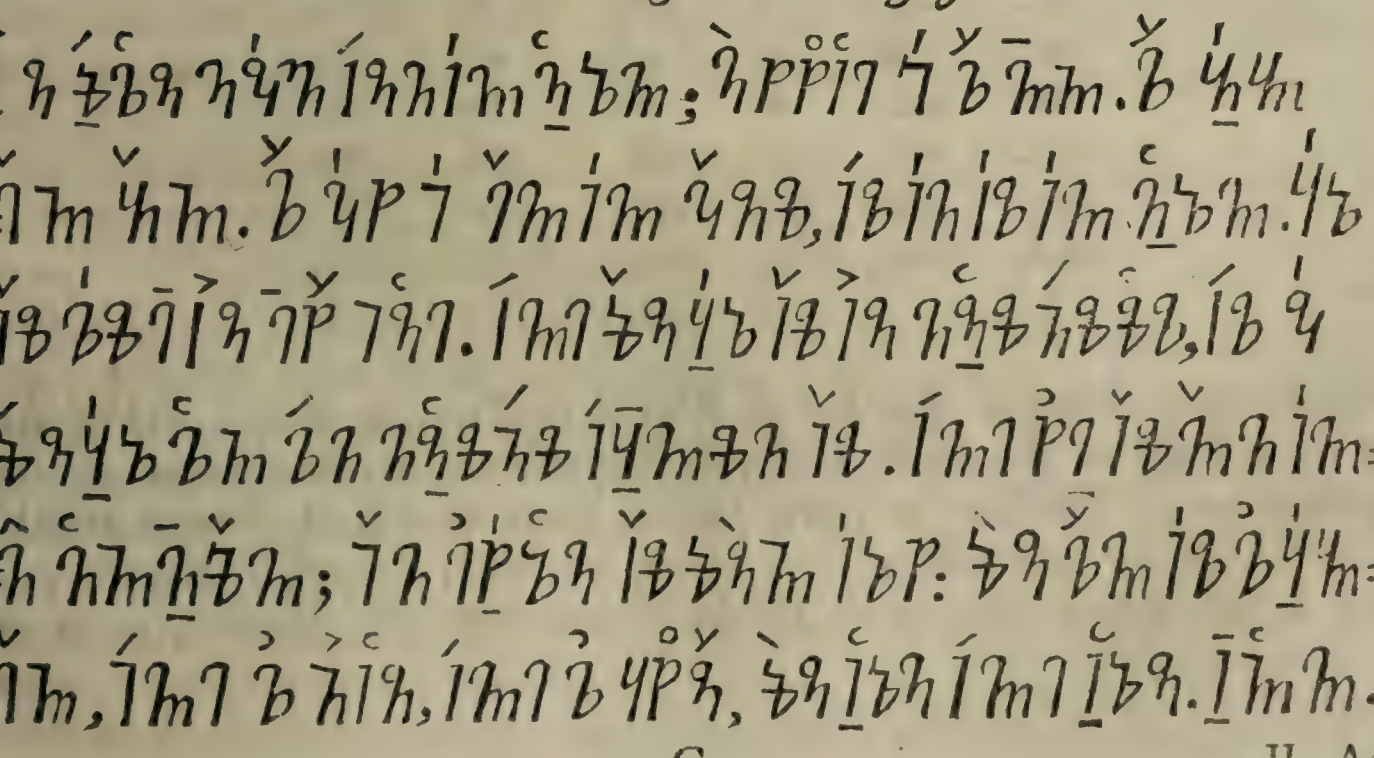
	1	2	3	4	5	6	7
1	b	d	j	g	=	=	p L
2	p	t	ch	k	=	=	
3	m	n	gn	ng	=	=	
4	=	dh	j	g	v	z	B Lh
5	=	th	sh	ch	f	s	
6		n					

8	9	10	11	12		
h	y	r	w	a		

The Table of Vowels

1	2	3	4	5	6	7	8	9	10	11	12	13	14
a	a	a	e	ea	i	u	ui	y	o	u	eu	oo	ou

The Lords Prayer in Engliſh.



An Essay towards an Universal Primer; *by Mr.* Fr. Lodwick. *n.* 182. *p.* 134.

II. As the Present *Alphabets* are Imperfect, so are also the *Primers* or first Books, wherein Children and others are taught to *Spell* and *Read*; *First* in not having a perfect *Alphabet*: *Secondly*, in not being Digested in such a Method as is Fit and proper to Teach them, as they ought to be Taught. For the Usual way of Teaching to *Spell*, is to Dismember every *Syllable* (of more than one *Letter*) into Many *Syllables*, by expressing every Letter apart, and *Syllabically*, and the *Consonants* with such a *Vowel* as they are ordinarily Nam'd with, and then requiring them to Joyn all these *Syllables* into one *Word*. But how prepostorous this Method is, one Instance for all will manifest; Suppose the Monosyllable *Brand* be to be *Spell'd*, they will Teach them thus to Dismember it, *Bee, er, a, en, dee*, and then require them to Joyn these into one *Syllable*, which 'tis impossible to do, and they must be necessitated as they have begun, to Express this one *Syllable* by five *Syllables*, which was not design'd: whereas they should Teach them to express every *Syllable* Entire at first Sight, without Dismembring it. And to do this, they must Proceed Gradually; first beginning with the most *Simple Syllables*, and so by Degrees proceeding to the more Difficult and *Compounded*, till they can readily Pronounce a whole *Syllable* at first Sight, even the most Difficult that are. To that end, let all the *Primers* be thus contriv'd; at the Top of the Leaf, let all the *Vowels* be plac'd *Singly* in order as they follow in One *Rank*: And under the same, place *Syllables*; *first* of *One Vowel* and *One Consonant* following it, throughout all the Variations; then of *One Consonant* and *One Vowel* following; 2*dly*, of *Two Consonants* before, and *One Vowel* following, throughout the Variations; 3*dly*, of *One Vowel* and 3 or 4 *Consonants* following; and of 3 *Consonants* going before, and *One Vowel* following; 4*thly*, of *one, two*, or *three Consonants* going before a *Vowel*; and *one, two, three* or *four Consonants* following; 5*thly*, of some *Syllables* with *Diphthongs* or *Tripthongs*. For Instance;

a.	*e.*	*i.*	*o.*	*u.*	&c.
ab.	*eb.*	*ib.*	*ob.*	*ub.*	&c.
ad.	*ed.*	*id.*	*od.*	*ud.*	&c.
ba.	*be.*	*bi.*	*bo.*	*bu.*	&c.
ald.	*eld.*	*ild.*	*old.*	*uld.*	&c.
dra.	*dre.*	*dri.*	*dro.*	*dru.*	&c.
balm.	*belm.*	*bilm.*	*bolm.*	*bulm.*	&c.

After this, Place a Number of Words of *Two*, 3, or 4 *Syllables*, from the more Easy to the most Difficult Expressions, without heed to their Significations. Further let there follow some Words of several *Syllables*, with the *Accent* variously plac'd, as on the *First*, *Second*, *Third*, &c. Let there be also two or three small *Discourses* writ with this *Alphabet*, in so many

ny ſeveral Languages, with the *Accent* rightly Placed, and truly Diſtinguiſh'd by their *Pauſes*.

In *Teaching* with this *Primer*; Begin to Teach them the true Sound of all the *Vowels* Singly, then proceed to the following *Single Syllables*, beginning with the Eaſieſt of Expreſſion, and ſo proceed on gradually to the moſt Difficult, and then to the *Words* of more *Syllables*, and laſtly, to the Uſe of the *Accent* and *Pauſes*. When the Learner hath paſt all theſe, you may exerciſe him in the Reading of the *Diſcourſes*, and therein let him exactly obſerve the *Accent* and the *Pauſes*. When they can *Read* and *Utter* exactly whatſoever is *Written* in this *Alphabet* and *Character*, in what Language ſoever, Teach them to *Write* truly what they Hear diſtinctly Expreſſed, according to this *Alphabet*, proceeding therein gradually as before, and rightly to Place the *Accent* and *Pauſes*, and alſo the Uſe of the *Signs* of the Different *Modes* of Speaking.

In *Teaching* alſo obſerve theſe neceſſary *Rules*. 1. Proceed Leiſurely and Orderly; ſuffer them not to paſs by any *Miſpronunciation* uncorrected, from the beginning to the end; Cauſe them ſo oft repeat a Wrong *Pronunciation*, till with your Aſſiſtance they *Pronounce* it Truly, allowing for the Natural Defects in the Speech of ſome Perſons. The Younger will learn theſe *Pronunciations* more eaſily: but the Elder may Attain them alſo, although with more Difficulty. 2. Suffer them at no hand in *Spelling*, to Diſmember any *Syllable* by repeating the *Letters* Singly, but that they *Pronounce* them whole as they find them.

This *New Primer* will without Change, except in the Title, be the ſame for all *Nations* and *Languages*.

III. M. *Pezron's* Notion of the *Greek*, *Roman*, and *Celtick Languages*, being of one common Origine, agrees exactly with my Obſervations: But I have not advanced ſo far, as to Diſcover the *Celtick* to be the *Mother Tongue*; though perhaps He may not want good Grounds (at leaſt Plauſible Arguments) for ſuch an Aſſertion, The *Iriſh* comes in with us, and is a *Dialect* of the *Old Latin*, as the *Britiſh* is of the *Greek*: But the *Gothick* or *Teutonick*, tho' it has alſo much Affinity with us, muſt needs make a Band apart.

Some Obſervations on Languages; by Mr. Edw. Lhwyd. n. 243. p. 280.

IV. Whether there ever were any *Language Natural*, I diſpute not: But that there have been, are, and may be *Artificial Languages* 'tis not difficult to Prove. The *Chineſe Court-Language* is ſaid to be of this Kind, Invented and ſpoken by the *Literati* and *Mandarins* throughout the whole Empire of *China*, differing from all the other *Languages* ſpoken in it: And I conjecture it to be nothing elſe but the Names of the *Characters*, by which they Write and Expreſs their Meaning, Arbitrarily Impoſed by them, as we in *Europe* ſet Names to *Arithmetical Figures*, not as we Pronounce Words written with a *Literal Character*. This I judge by comparing the *Characters* with the Names, Monoſyllables, or Words, they Pronounce and Read them with. Nor do they Aſcend above a Monoſyllabical Name, tho' the *Character* be Compoſed of many *Single Characters*, each of which hath its pro-

Some Obſervations and Conjectures concerning the Chineſe Characters; by R. H. n. 180. p. 63.

per Sence and Monoſyllabical Name, and tho' the Meaning of each Character be an Ingredient in the Notion of that Compounded Character.

But whatever we may judge of *Language*, 'tis paſt Diſpute that *Writing* was ever *Artificial*, how Anciently ſoever it were in Uſe; and was the Invention of ſome Thinking and Studious Men. 'Tis alſo Evident that there have been various ways thought of for Expreſſing Significancy, according to the ſeveral *Genii* of the Perſons that were the Inventors: As may be gueſſed by the *Ægyptian Hieroglyphicks*, the *Chineſe Characters*, the *Mexican Chronology*, and the *Literal Characters* of ſeveral Nations: each of which ſeem to proceed upon Differing Methods and from Differing Thoughts of Invention.

Which of theſe ways is the moſt Ancient, is hard to prove. The *Ægyptian Mummys* and *Obelisks* prove a great Antiquity of the *Hieroglyphicks*; but yet the *Chineſe Chronology* (if to be Credited) outſtrips the *Ægyptian* in pretence to Antiquity. For the *Chineſe* make *Fohi* the firſt King of *China* to be the Inventor of their *Character*: And account him to have lived 2950 *Years* before the Time of *Chriſt*; during all which Time they Pretend to have a Certain and Written Account in their Books. But their Account of the Times Preceding, they eſteem more Hypothetical and Fabulous; depending chiefly upon Fiction and Oral Tradition: As you will eaſily believe, when you underſtand how many *Years* they make it ſince the *Creation* of the *World* to the preſent *Year* 1686. which by the Account thereof in Mr. *Greaves* his Tranſlation of *Ulug. Beig.* will be found to be no leſs than 88640102 *Solar Years*; there having been run out ſince the *Creation* 8864 *Ven.* of Years (every *Ven* containing 10000 ſuch Years) and of the preſent *Ven.* this Year 1686 is the 102d. Which Account is abundantly more extravagant than the *Ægyptian*: but this need not invalidate their Hiſtory ſince *Fohi*; by which it appears that their *Character* was Invented before the Time of *Moſes* about 1400 Years, and even before *Menes* the Firſt King of *Ægypt* about 500 Years. So that the *Chineſe* Invention of *Writing* or *Characters*, ſeems to be the moſt Ancient of that kind: and the Book *Yekim*, ſaid to be written by *Fohi*, the moſt Ancient Book.

Theſe Accounts made me the more deſirous to underſtand ſomewhat of the Reality and Truth of what is related concerning the Knowledge of *Literature* and *Manual Arts*, which theſe People of *China* are ſaid to have poſſeſſed ſo long a time in ſo great Perfection, and without Alteration from the Primitive Inſtitution; eſpecially upon the Account of their Art of *Printing* which gave a Hint to the Inventors of that admirable and moſt uſefull of all Inventions (for the Common-Wealth of Learning) the way of *Printing* here in *Europe*. For *Paulus Jovius* affirms that the firſt Occaſion of that Invention in *Germany*, was a *German Merchant*, who returning out of *China* into his own Country, related what he had obſerved concerning the Practice of it as uſed in that Country. And tho' the *Chineſe* way, be wholly Differing as to the Method of *Compoſing*, from what was Invented and Perfected

fected here: Yet ſuch an Intimation was enough to an Ingenious Artiſt to Improve the firſt Contrivance, and make it more accommodate to the *Literal* Way of Writing with us. And as our way may poſſibly be now brought to the greateſt perfection for Exactneſs and Expedition, ſo without doubt muſt be their way of *Printing* any thing juſt as 'tis Written, ſince I find, that they can *Ingrave* their *Stamp* for a Sheet, as ſoon as one of our *Compoſiters* can *Set* and *Correct* a Sheet of our *Literal Character*, and when ſo done, one Man alone will *Print off* 1500 Sheets in one day. And though 'tis Generally believed to be much the ſame with our *Wooden Cuts* for *Printing*, yet from ſome Obſervations I have made, I believe it to be much another way.

By a *Chineſe* Manuſcript, out of which I Tranſcribed the Lord's Prayer in the Year 1666 (when it was loſt) I found that the Pronunciations had no Affinity with the Streaks of the *Character*. Whence I conceived it was either a *Numeral Character* conſiſting of *Numbers*, or elſe a *Real Character*, but not a *Literal*, unleſs it were a *Literal Character* of ſome other Language than that by which it was Pronounced, whoſe Pronunciation is Loſt though the Significancy be Retained; as if one ſhould read what is written in Hebrew בראשית ברא into the *Latin* or *Roman* Language, *In Principio Creavit*, inſtead of *Braſit Bra*, or *Bereſith Bara* according to the *Maſorethæ*.

Since that time I procured from *China* a *Dictionary* of the *Court-Language* (as I found it written upon by the Perſon that ſent it me from thence) But this whole Book (which I found was *Printed*) conſiſted only of the *Chineſe Characters* without any Interpretation, or Pronunciation: however by the Help of the Pictures of that, and a *Chineſe Almanack*, I quickly found out their *Characters* for *Numbers* and their way of *Numeration*, together with the *Figure* and the uſe of their *Abacus* or Counting Board, for performing the Operations of *Arithmetick* which I find pretty near to agree with that of the *Antient Romans* (a Deſcription and Picture of which is given by *Urſinus*, *Pignorius* and *Velſerus*) ſave only that, inſtead of Pinns and Sliding Groves of the *Roman*, the *Chineſe Abacus* hath Strings or Wires and Beads, to ſlide upon them; and that, inſtead of 4 Pinns for *Digits* or *Unites*, the *Chineſe* hath 5 Beads: So that it may ſeem to Argue that the *Chineſe Abacus* was deſigned for a *Duodecimal Progreſſion*: Whereas that of the *Romans* was deſigned for the *Decimal*. One thing is remarkable in the *Chineſe*, that I find the Places in the *Abacus* to lie Horizontal, and the Firſt Place to be that next the Left Hand, which I judge was alſo the Firſt in their Old way of *Reading*, much the ſame with ours, though their other *Characters* are Erected, as I ſhall by and by ſhew from the Poſture of *Writing* and *Reading* which I conjecture they did at firſt make uſe of; and what does yet further agree with this Conjecture, 'Tis remarkable in the newly mentioned Treatiſe of *Ulug Beig*, That whereas the way of Writing and Reading uſed by the *Arabs*, was from the Right to the Left, the Firſt Place or the Place of Unites in their *Numeration*, was that next the Right Hand; and ſo came firſt to be Read: as did that of *China*, who as I conceive Read the contrary way, from the Left to the Right.

It

It appears therefore by this Remark that we received this way of Expreſſing *Numbers* from the *Arabians*, for that we keep the ſame Poſture or Poſition of Places with them, though our Progreſſion in Writing and Reading be the contrary way. And though we now Read them alſo in the order they are ſet, 21, 22, 36, 48, *&c.* yet we Retain alſo the other way of Pronouncing, *viz. One and Twenty, Two and Twenty, Six and Thirty, Eight and Forty*, &c.

Now as the *Chineſe*, and *Roman Abacus* do much Agree, ſave only that they proceed contrary ways, ſo doth their way of Expreſſing Numbers by Letters or Marks, One Stroke or Line Signifying *One*, 2 Lines *Two*, 3 Lines *Three*, a Croſs *Ten*, 2 Croſſes *Twenty*, 3 Croſſes *Thirty*, and ſo onwards to a *Hundred*, which they expreſs'd by a Square Mark, and a Croſs with a Stroke added for a Thouſand, as will appear by the Table Annexed. And though the *Characters* are not all the ſame; yet the Order and Method of one agrees very near with that of the other, eſpecially if I may be allow'd my Suppoſition, that the Primitive way of Writing and Reading with the *Chineſe* was Horizontal, and like the *Greek* and *Latin* or *European* way. Now that theſe are properly *Numeral Figures* or *Characters*, is Manifeſt from this, that they have alſo *Word Characters* for every Number, and they can (in the ſame manner as the *Romans* could) Expreſs a *Number* by their *Numeral Characters*, or *Marks*, and by their *Literal* or *Word Characters*; for as One Single Stroke ſignifies *One* or the *Firſt*, ſo does the *Character* (in the Plate marked with E) ſignify the ſame Thing, that is *One* or the *Firſt*.

Having thus diſcovered their *Characters* for *Numbers*, and their way of *Numeration*, I was next deſirous to underſtand ſomething concerning their *Language* and *Character*.

Upon Peruſing all the Accounts I could meet with in Books, I found very little ſatisfaction as to what I inquired after, which was *Firſt* concerning the Method of the *Character*, whether it conſiſted of a certain Number of Marks methodically diſpos'd like *Letters* in a *Literal*, or like *Numbers* in a *Numeral*, or like *Radicals* in *Compoſite* or *Decompoſite Derivations*? 'Tis ſaid to be Legible into a great many *Languages* conſiderably Different one from another, but how this is Effected is not related, only 'tis ſaid that the Marks are of the Nature of our *Arithmetical Figures*, (which are become almoſt Univerſal, at leaſt to us here in *Europe*). And *Secondly*, concerning the Number of theſe *Characters*? To which I found as little Satisfaction: For by ſome Relations I found that there were 120000, by others 80000, and by others 60000. And that a Man muſt be able to Remember to Write and Read at leaſt 8000, or 10000, before he will be able to Expreſs his Meaning thereby; and that it is the buſineſs of a Man's whole Life to be throughly underſtanding in the *Whole Character*; ſeeming to Intimate that the *Characters* are Immethodical, and there are as many *Primitive Characters* as Words. Others tell us of Various Kinds of *Characters* which have been in uſe in ſeveral Ages. The *Firſt* they ſay were *Hieroglyphical* like the *Ægyptian* or *Mexican* conſiſting of Pictures of Animals and Vegetables. But that the *Laſt* are made up of Lines and Points; that they have no ſuch thing

thing as *Letters* or *Syllables*, but every Diſtinct Word and Notion has a Diſtinct *Character*; and that all are *Primitive* or *Incompoſit*, ſo that if *Calepine*'s Dictionary were to be Tranſlated into the *Chineſe*, 'twere neceſſary to have as many Diſtinct *Radical Characters* as there are Words therein to be found. Which Accounts do ſeem to Inſinuate that this *Character* is the moſt Difficult, and the moſt Perplex'd piece of Learning in the World, and depends wholly upon the Strength of the Memory in retaining the Form and Signification of a Perplexed Scraul. But whether they who gave us theſe Accounts did do it Knowingly, is much to be doubted, my own Obſervations at leaſt, make me think otherwiſe.

I have not yet been able to procure ſufficient helps to inform my ſelf of the whole Art of *Writing* and *Reading* the *Chineſe Character*, and I fear the Relations I have hitherto met with concerning it, were written by ſuch as did not well underſtand it: However from ſuch Helps as I had, what I collected or do conjecture, I ſhall here relate. The beſt Help I had, was the peruſal of ſome Books Printed in *China*, with the Pronunciation and Signification of the *Character* in *Latin Letters*. By theſe Books I then obſerv'd, *Firſt* that every one of their *Characters*, whether conſiſting of more or fewer Strokes, or Marks, were compriſed within a certain Square Space, which is proportion'd according to the Bigneſs of the Size or Manner of Writing, they deſign there to make uſe of; not that the whole Square is Filled with every *Character*: but that no part of that *Character* does Exceed the Limits of that Square, ſo that, though the *Character* have but One Stroke, it takes as much Room in the Line as another that hath 20 or 30 ſeveral Marks; ſo that their *Characters* are moſt exactly Ranged in Rank and File, not unlike our *Numbers* in *Arithmetick*.

Notwithſtanding which, I find they do Vary the Bigneſs of the *Character* upon ſeveral Occaſions, as in the *Titles* of *Books*; in the *Titles* of the *Chapters*, or *Sections*; in the *Comments*, *Explications*, or *Notes*; and upon ſeveral other Occaſions of Variety, which they do at Pleaſure with their Pencil, as we uſe Variety of Letters in the *Printing* of a *Book*. The *Titles* of *Books* are generally in very Large Characters, 6 or 8 *times* as big as thoſe of the Book; the *Explication Notes* $\frac{1}{2}$ of the Bigneſs; the Contents uſually *twice* as Big; and the like Variety on Several other Occaſions. I have met with alſo *Three* ſeveral Kinds of *Characters*: *Firſt* The moſt Uſual is the Fixed or *Set Square* Form. The *Second* ſort is the *Running Hand*, in which the Orders of the Courts are written by their Secretaries, of which I have ſeen Three or Four Kinds, in which the Pencil is never taken off till the whole *Character* be Finiſhed, and ſome times Two or Three are all written without Break. The *Third* ſeems to be ſomewhat like the *Flouriſhing* Great Letters uſed by Scriveners at the beginning of Deeds, and by the *Germans* in the beginning of Chapters and Sections. They are compounded of the ſame Strokes as the *Set Character*, but moduated and ſhaped a little otherwiſe, to make them appear the more Beautiful and Regular. A Specimen of each of theſe Three are in the *Plate*. This 3*d* is made uſe of for *Epitaphs* and other *Inſcriptions* on Buildings or Monuments.

ments. Theſe 3 ſorts I may call the 3 General Kinds of Writing, but there is to be found an almoſt Infinite Variety of Forms, which Men uſe. This will be the more eaſy to be believed, when we conſider that the *Printed Characters* are exactly the ſame with the *Written*: inſomuch that every Variety in each Stroke, Line, or Point, that is or can be made with the Pencil, is perfectly expreſſed in the Impreſſion, and the Form, Mode, or Hand, as we call it, of every Writer is exhibited ſo curiouſly, that I think it hardly poſſible to be perform'd after the way of *Woodden-Cuts*, as Authors affirms it is, but muſt be done after the Method of our *Copper Cuts*, Printed by a *Rowling Preſs*, which the way of expreſſing the *Running* or *Court-Hand*, does I conceive moſt evidently Demonſtrate; and from divers Circumſtances, I could evidently make appear from the Book it ſelf, which I cannot ſo well expreſs in Writing. Their *Paper* is generally very Thin and Fine, and very Tranſparent, but Brown, ſo that whatever is Written or Printed on it, is almoſt as Legible on the back as on the fore-ſide, which is of great uſe in the Cutting of their *Stamps*. And thence they never Write or Print on both ſides of the ſame Leaf but only on One, and to make the Leaf appear Printed on Both Sides, they double the Sheet with the Printed ſides Outwards, and putting the Folded part forward, they Sow, Bind, or Stitch together, all theſe Sheets by the Cut Edges, and upon whole Sheets inſtead of ſingle Leaves. They begin the Book on the Top of the Right Hand Side of the Page that is next the Right Hand, and they Read downwards to the Bottom, then begin the next Line towards the Left Hand at the Top, and ſo Read to the Bottom, and ſo Proceed to the End of the Book. But this I ſuppoſe not to be the Primitive or Firſt way of Writing or Reading. The *Title* of the *Book* is ſet firſt upon a whole Leaf, uſually of a Thicker Paper, and ſome *Title* is likewiſe written upon the Folding or Edge of every Sheet, where is ſet alſo the Number of the Book, and the Number of the Sheet, half of which appears on one ſide, and half on the other ſide of the Fold.

As to the *Character* it ſelf, I find (by all the Books and Writings I have yet met with of that kind) that each of them is made up of a certain number of Strokes, Lines, or Marks, which are very Diſtinct from each other in their Shape and Poſition: and by reaſon that theſe are Single Strokes, and as I conceive Uncompounded, I think they may be called the *Letters*, *Elements*, or *Particles*, out of which the more *Compounded Characters* are Conſtructed or Contexed. Theſe are the Firſt Kind of which there are but a very few, and I think thoſe I have deſcribed in the 13th Line of the *Plate* are all.

Two, Three, Four, or More of theſe Joyned together in a certain Order and Contexture (in the doing of which there is a great Regularity and Order obſerved, which is not varied from, and all within the Regular *Square Space*) I conceive do make *Syllables* or *Primitive Radical Characters*, each of which have a Primitive, Single, or Diſtinct Notion, or Signification, as well as Sound: which is made much uſe of in the more Compounded Characters, or Words. Of this kind I take the Figures of the Numbers to be: If at leaſt they are not Single Letters like the way of expreſſing Num-

Numbers in the *Hebrew*, *Greek*, *Arabick*, &c. Languages, for though there may be Two or Three of the Single Strokes joyn'd together into a Compound Character, it hinders not, but that it may ſtill Signify a *Letter*, as in the *Greek* Α. Α. Δ. Ι. Γ. Π. Τ; in the *Runick*, where every Letter hath One Upright Line and ſome other Additional Marks; In the *Roman* I. L. F. E. O. Q. V. Y. Or it may ſignify a *Syllable* as in the *Æthiopick*, and in the *Hanſcrit*, and *Sunſcrit Languages* and *Characters*; The *Firſt* of which being the *Brackmans* Character we find in P. *Kircher*'s *China Illuſtrata*, deſcribed by P. *Roth*, who ſtudyed it 7 Years; and the Second (being a *Literal Character* uſed over all *India* by the Merchants) I have ſeen in a Tranſcript brought lately out of *India* by a very worthy Gentleman, who Lived there many Years, and had the Curioſity to cauſe to be Tranſcrib'd and Tranſlated alſo into *Engliſh*, a Dictionary of their Language in their own Character.

In which *Characters* or Ways of Writing a *Vowel* is always joyn'd with a *Conſonant* into one *Compound Character* to make it Effable. And then the Single Strokes may be taken for Single ineffable *Letters*, as are the *Conſonants*, and the Compoſition of Two or Three (of which one at leaſt may be a *Vowel*) will make *Syllables*.

Of this Kind, there are not ſo many in the whole *Chineſe Character*, but that it will be eaſy enough to aſſign each a Proper *Monoſyllable*, which ſhall have only One or Two *Conſonants*, and One or Two *Vowels*: That is the *Conſonants* together and not ſeparate, either both before the *Vowel* or *Vowels*, if it it be a *Diphthong*, or both After it or them.

Of this Kind I underſtand there are about 500, probably 8 x 8 x 8, or 512. I could Enumerate a great many, and give you alſo the *Name* or *Words* by which they are Pronounced as alſo their Significations. But (as I ſaid before) Firſt, I conceive the preſent *Chineſe Language* to have no Affinity at all with the *Character*, the True Primitive, or Firſt Language, or Pronunciation of it, having been loſt. And Secondly, I want ſome further Help to make a Full and Compleat Diſcovery.

The 3*d*. ſort of *Characters* is a *Decompounded* ſort, being made up of Two, Three, or more of thoſe of the *Second* Kind, Diminiſht proportionably in their Size, either as to their Length, or Breadth, or both, from what they have in the ſame Writing when they are Single, and fill up the whole *Letter Square* or *Words Square*. For there being ſeveral of them to be Crouded together within the ſame *Square*, according as they are more in number, ſo they are always more Squeez'd together. In this *Decompound* ſort, there is a Regular Order obſerv'd in the Placing of the ſeveral *Characters* of the 2*d*. ſort; their being ſome that are always on the Left Side, ſome always on the Right, ſome at the Top, ſome at the Bottom. Of which I doubt not but that they have a certain Regular Method, which had we Dictionaries Explain'd would be eaſy enough to be diſcover'd.

This Method alone of Crouding together All the *Characters* (how many ſo ever go to make up the *Decompounded Character*) into one *Square*, (which is of the Same Size for the moſt *Simple* and for the moſt *Compound*) ſeems to be

the great Singularity, by which the *Chineſe Characters* Differ from thoſe of all the reſt of the World. And this I conceive, has been the Reaſon, why all People, and poſſibly even the very *Chineſe* themſelves have, and do believe it to be a *Real* and not *Literal Character*: For if the Primitive Language, or Pronunciation of the *Characters* be loſt (as I conceive it is) and that the Diſpoſition, Order, Method, Texture, or Manner of Placing the more *Simple* in the more *Compounded Characters* be alſo Loſt, Forgotten, or not Underſtood, then the whole *Characters* become a *Real* and not a *Literal Character*: And an Immethodical one to ſuch as want the Method, that muſt be Learnt by Roat and Depend wholly upon the Strength of the Memory to retain it. But I conceive it might be at Firſt either a *Literal Character*, and ſo the whole *Square Character* was compoſed of ſo many Diſtinct *Letters*, or *Syllables*, which compoſed the *Word* ſignify'd thereby; and ſo there might be a Regular Order of Placing theſe *Letters* in the *Characters*; That is, that the whole *Square* being Divided into ſo many parts, there was a Rule which was the *Firſt*, 2*d*. 3*d*. and 4*th*. Place: So that there being Plac'd in thoſe the ſeveral *Letters* that made up the *Word*, according to the Order they had in the Word, it was eaſy by that Rule to *Decipher* the ſaid *Character*, and thence to find the *Word* and the Signification, as Regularly as if the *Letters* had been Written one after another, as moſt other *Literal Characters* we know are at this Day Written. Or *Secondly*, it might be a *Real Character* conſiſting of divers Marks or *Letters*, that Expreſſed ſo many *Simple* Notions, ſeveral of which joyn'd together might make up the more *Compounded Characters*, of which I have Added ſome Examples in the *Plate*, which may be alſo made *Literal* and Pronounceable, tho' that Conſideration were not made uſe of when they were Firſt Invented. What things I have obſerved in my *Chineſe* Books that ſeem to reſpect this Method, I will give more particulars of by Printing a Specimen of the Book *Ye-kim*, which Explicated by theſe Notions will I conceive appear more Intelligible, than by the Accounts we find given of it by the *Chineſe* Commentators, and thoſe that have Tranſlated them into *Latin*, who ſeem not to have underſtood the True Deſign thereof. For both the *Chineſe* and *European* Commentators Aſſert it to be a Conjuring-Book, or a Book to tell Fortunes by, and to be made uſe of by the *Chineſe* for that purpoſe: Whereas by the ſmall Specimen I have ſeen of it, I conceive it to contain the whole Ground, Rule, or *Grammar* of their *Character*, Language, and Philoſophy; and that by the Underſtanding of it, the Foundation and Rule of their Language, and *Character*, may be without much Difficulty *Deciphered* and Underſtood.

The preſent Uſe of this *Character*, I conceive to be Differing from what it was at Firſt, both as to the Poſition of *Writing* and *Reading* it; and as to the Expreſſion and *Pronunciation* thereof. For the way of *Writing* and *Reading* it I conceive might at firſt be exactly the ſame with that of the *Greeks*, *Romans*, *Engliſh*, and all other *European* Nations, and alſo the *Æthiopick* and *Coptick*; That is they began at the top of the Page towards the Left Hand,

and

and ſo Proceeded towards the Right in the Horizontal Line to the End of it, and then began at the Left End of the next Line under the firſt, and proceeded with that in the ſame manner, and ſo with the next under that, and all the remaining, Continuing to *Write* the Words of the Line towards the Right Hand, and the Lines of the Page one Under another, till the whole Diſcourſe were compleated, joyning Leaf to Leaf one Under another, after the ſame manner as the *Rolls* are at preſent Writ, and as the *Volumina* were of the Antients. And to make the parts of the *Volume* to be the more eaſily to be come at, without the trouble of Rolling and Unrolling, as the Antient *Romans* did, and we do with our *Rolls*, they contriv'd to *Fold* them, like the Folds of a Fan, forwards and backwards, and ſo Stitching them together, that the Written Sides might lie outwards, and open freely one from another, and the Fair ſides might meet together, it came to make the Preſent Form of their Books, which being laid, as we generally place our Books, before us, they ſeem to begin at the Top of the Page on the Right Hand, and to proceed to the Bottom, and then at the Top of the next Line towards the Left Hand, and Deſcend as in the former; proceeding in this order with all the reſt. Which way muſt needs be very Inconvenient for Writing, however they may uſe their Pencil differing from our Pen. Though there be a way of Writing from the Top to the Bottom of the Page, which is very convenient for Writing the *Syriack*, as alſo for Writing *Latin*, *Engliſh*, or *Greek*, where the Writing is to be uſed for *Cutting* the *Stamps* of *Wood*, or *Graving* of *Copper-Plates* with the ſame *Character*, for *Printing*; in which Caſe the *Letters* muſt be written Backwards.

Secondly, As to the *Pronunciation* of this *Character*, by the *Court-Language*, or by any other now uſed, I conceive it to be wholly Differing from that of a *Literal Character*, that is from being *Pronounced* or Spoken according to the Marks or Figures thereof, whether they be *Simple*, or *Compounded* and made up of *Simple Characters* (though there are ſome Inſtances of Affinity in *Characters* and *Words*.) The reaſon of which Differing *Pronunciation*, I conceive may have proceeded, Partly from the Loſs of the Primitive Language, for which it was made; Partly from a moſt Inconvenient Affectation of *Monoſyllabical Words* in this *Court-Language*; to help the Poverty of which, they are fain to make one *Syllable* to ſignify many Differing Notions, to do which they have Introduc'd a kind of Muſical *Toning* or *Accenting* of each of them, and that not Singly but Compound of Two or Three *Tones* to each Signification of every one of theſe *Monoſyllables*; Partly from the uſing this way of Writing, by Divers Nations of Differing Languages, who minding only the Figure and Signification, Read it in their own Mother-Tongues, as we in *Europe* do *Arithmetical Figures*; and Partly alſo from the Omiſſion of moſt *Grammatical* Diſtinctions, the ſame *Character* ſerving for *Subſtantive* and *Adjective*, *Singular* and *Plural*, in all *Caſes*, (ſave only they have ſome Characters for Particles as *of* and *to* in *Engliſh*) for the *Verb* in all *Tenſes*, and *Numbers*, &c. for the *Abſtract* and the *Concrete* Signification, and for divers *Metaphorical*: If at leaſt the Interpretation I have met with in the Books I have peruſed be Exact;

Partly alſo, from the *Syntaxis* of them, it being neceſſary to conſider the whole Sentence, to Diſcover which Part of Speech each *Character* is of, in that Sentence, wherein the Order and the Poſitions of the *Characters* to one another, for which they have Rules, hath its Signification; And laſtly, from the Loſs of the very Notion of a *Literal Character*, whence for the Expreſſing of *Proper Names*, they are Fain to make uſe of ſeveral *Characters*, whoſe *Sounds* or *Words* come neareſt to the Sound of the *Syllables* of that *Name*, as in the *Plate tam, jo, vam*; for *Adam. Jovan.*

Now, though I conceive, this *Character* is not Effable properly as a *Literal Character* by any of their Preſent Languages; And though poſſibly it might be at Firſt a *Real Character*, that is each of them Compounded of ſuch Strokes or Marks as by their Figures, Poſitions, and Numbers, in the *Square*, denoted the ſeveral Philoſophical Ingredients that made up the Notion of the whole *Character*, as the Book *Ye-Kim* ſeems to ſhew by giving Rules as I conceive for the Order and Significancy of Places in the *Square*, &c. Yet I think it not Difficult to make it a *Literal*, or at leaſt a *Syllabical Character*, and Legible into a Language ſomewhat after the manner of the *Univerſal Character* invented by the Reverend Biſhop of *Cheſter*, Dr. *Wilkins*. And though this would not be the Primitive Language for which it was made, yet for the preſent Uſes of it (the chiefeſt of which is the Aſſiſting and Refreſhing the Memory, and Helping the Imagination by proper Sounds) it might be as Good: Wherein the *Single Characters* might be *Monoſyllables*, and the *Compounded*, *Diſſyllables*, *Triſſyllables*, &c. according to the Number and Order of *Simple Characters* in the *Square* of the *Compounded*. And I am apt to think, that the Preſent *Pronunciation* of Languages, as of *Hebrew*, *Syriack*, *Arabick*, *Greek*, and *Latin*, or any other Language that has been ſo long written, may be as much Differing from what it was 2000 Years ſince, as an Arbitrary one now Invented, and grounded on the *Letters*, might poſſibly be. And ſuch an Arbitrary *Pronunciation*, if generally agreed upon, might ſerve *As Well* for a Help to Learn the Signification of *Words*, or *Word-Combination* of *Characters*, as if we now knew the exact Primitive *Pronunciations*, as Critically as the *Maſorethæ* are ſaid to have done that of the *Hebrew*; and poſſibly alſo *Much Better*, for that by ſuch a one a great many Irregularities and Difficulties of *Pronunciation* (which are to be found in all Languages now Spoken) might be Omitted, and the whole made exactly Regular and Eaſy, as might be Shewn in the *Hebrew*, and *Greek*, and eſpecially in the *Arabick*, whoſe Difficulties are ſufficiently manifeſted by the *Alphabetum Arabicum*, Printed at *Rome*. 1592. Now as by ſuch a Language, the *Character* might be made Effable without *Muſical Tones* or difficult *Aſpirations*, ſo had we Dictionaries of the Signification of the *Characters*, we might as ſoon learn the *Chineſe Character*, as we can *Latin*, or any other Language to be Learnt by *Book*, and not by *Speaking*.

Two Perſons Deaf and Dumb taught to ſpeak and to Underſtand a Language; by Dr. J. Wallis. n. 61. p. 1087.

V, 1. About the Beginning of *Jan.* 166½. I undertook to teach a Perſon *Dumb* and *Deaf* to *Speak* and to *Underſtand a Language*, The Task conſiſts of two very Different parts; each of which doth render the other more

Difficult.

Difficult. For beſide that which appears upon the firſt View, to Teach a Perſon who *cannot Hear*, to *Pronounce* the *Sound of Words*, There is that other, of Teaching them to *Underſtand a Language*, and know the *Signification* of theſe *Words*, Whether Spoken or Written, whereby he may both Expreſs his own Senſe, and Underſtand the Thoughts of others. That each of theſe do render the other more Hard, is obvious. We find by Experience that the moſt Advantageous way of Teaching a Child his Firſt Language, is that of perpetual Diſcouſe; not only what is particularly addreſs'd to himſelf, as well in Pleaſing Divertiſements or Delightful Sportings (and therefore Inſinuates it ſelf without any Irkſome or tedious Labour,) as what is directly intended for his more Serious Information: But that Diſcourſe alſo which paſſeth between Others; where without pains or Study, he takes notice of what *Actions* in the Speaker do accompany ſuch *Words*, and what Effects they do produce in thoſe to whom they are Directed; which doth by Degrees, Inſinuate the Intendments of theſe *Words*. But theſe Helps are wholly obſtructed in our Caſe by *Deafneſs*. And as *Deafneſs* makes it the more Difficult to Teach him a *Language*: ſo on the other hand, that want of *Language*, makes it more hard to Teach him how to *Speak* or *Pronounce* the *Sounds*. For there being no other Way to Direct his *Speech*, than by Teaching him how the *Tongue*, the *Lips*, the *Palate*, and other *Organs of Speech*, are to be Apply'd and Mov'd in the Forming of ſuch *Sounds* as are required; to the end that he may, by Art *Pronounce* thoſe *Sounds*, which others do by Cuſtom, they know not how; it may be thought Hard enough to expreſs in *Writing*, even to one who underſtands it very well, thoſe very nice Curioſities and Delicacies of Motion, which muſt be Obſerved (though we heed it not) by him, who without Help of his *Ear* to Guide his *Tongue*, ſhall Form that Variety of *Sounds* we uſe in *Speaking*: Many of which Curioſities are ſo Nice and Delicate, and the Difference in Forming thoſe *Sounds* ſo very Subtile, that moſt of Our Selves, who *Pronounce* them every Day, are not able, without a very Serious Conſideration, to give an Account, by what Art or Motion our ſelves Form them; much leſs to Teach another how it is to be done. And if by *Writing* to one who *Underſtands* a *Language*, it be thus Difficult to give Inſtruction, how without the Help of *Hearing*, he may Utter thoſe *Sounds*, it muſt needs increaſe the Difficulty, when there is no other *Language* to expreſs it in, but that of *Dumb Signs*.

Theſe Difficulties however did not ſo far Diſcourage me from that Undertaking, but that I did ſtill conceive it Poſſible that both parts of this Task might be Effected. As to the *Firſt* of them; Though I did not doubt but that the *Ear* doth as much Guide the *Tongue* in *Speaking*, as the *Eye* doth the *Hand* in *Writing*, or *Playing* on the *Lute*: And therefore thoſe who by Accident do wholly loſe their *Hearing*, loſe alſo their *Speech*, and conſequently become *Dumb* as well as *Deaf*, (for it is in a manner the ſame Difficulty, for one that *Hears* not, to *Speak* well, as for him that is *Blind*, to *Write* a fair *Hand*:) Yet ſince we ſee that 'tis Poſſible for a Lady to attain ſo great Dexterity, as in the *Dark* to Play on a *Lute*, though to that

Variety

Variety of Nimble Motions, the *Eye*'s Direction, as well as the Judgment of the *Ear*, might ſeem neceſſary to Guide the *Hand*; I did not think it Impoſſible, but that the *Organs* of *Speech* might be Taught to obſerve their Due *Poſture*, tho' neither the *Eyes* Behold their *Motion*, nor the *Ear* Diſcern the *Sound* they make. And as to the *other*; That of *Language* might ſeem yet more Poſſible. For, ſince that in Children, every Day, the *Knowledge* of *Words*, with their Various Conſtructions and Significations, is by Degrees attain'd by the *Ear*; ſo that in a few Years, they arrive to a Competent Ability of Expreſſing themſelves in their *Firſt Language*, at leaſt as to the more uſual Parts and Notions of it, Why ſhould it be thought Impoſſible, that the *Eye* (though with ſome Diſadvantage) might as well Apply ſuch *Complication* of *Letters* or other *Characters*, to Repreſent the Various *Conceptions* of the *Mind*; as the *Ear*, a like *Complication* of *Sounds*? For though, as things now are, it be very true that *Letters* are, with us, the immediate *Characters* of *Sounds*, as thoſe *Sounds* are of *Conceptions*: yet is there nothing, in the Nature of the thing it ſelf, why *Letters* and *Characters* might not as properly be apply'd to Repreſent Immediately, as by the Intervention of *Sounds*, what our *Conceptions* are. Which is ſo great a Truth, (though not ſo generally taken notice of,) that 'tis Practis'd every Day; not only by the *Chineſe*, whoſe Whole *Language* is ſaid to be made up of ſuch *Characters* as do Repreſent Things and Notions Independent on the *Sound* of *Words*; and is therefore differently *Spoken*, by thoſe who Differ not in the *Writing* of it: (like as what, in *Figures*, we Write, 1, 2, 3, for *One*, *Two*, *Three*, a *Frenchman*, for Example, Reads *Un*, *Deux*, *Trois*:) But, in part, alſo amongſt our Selves; as in the *Numeral Figures* now mention'd, and many other *Characters* of Weights and Metals, uſed indifferently by Divers Nations to Signify the ſame *Conceptions*, though expreſſed by a Different *Sound* of *Words*: And, more frequently in the Practice of *Specious Arithmetick*, and Operations of *Algebra*, expreſs'd in ſuch Symbols, as ſo little need the Intervention of *Words* to make known their meaning, that when Different Perſons come to Expreſs, in *Words*, the *Senſe* of thoſe *Characters*, they will as little Agree upon the ſame *Words*, though all Expreſs the ſame *Senſe*, as 2 Tranſlators of one and the ſame Book into another Language.

And, though I will not Diſpute the Practical Poſſibility of Introducing an *Univerſal Character*, in which all Nations, though of Different *Speech*, ſhall Expreſs their common *Conceptions*; yet, that ſome Two or Three, (or more) Perſons may, by conſent, Agree upon ſuch *Characters*, whereby to Expreſs each to other their *Senſe* in *Writing*, without attending the *Sound* of *Words*; is ſo far from an Impoſſibility, that it muſt needs be allow'd to be very Feaſible, if not Facile. And if it may be done by New invented Characters, why not as well by thoſe already in Uſe? Which though to thoſe that Know their Common Uſe, they may Signify *Sounds*; yet to thoſe that Know it not, or do not Attend it, may be as immediately apply'd, to Signify *Things* or *Notions*, as if they Signify'd nothing elſe: And conſequently, ſo long as it is purely Arbitrary, by what *Character* to Expreſs ſuch a *Thing* or *Notion*; we may as well make Uſe of that *Character* or *Collection* of *Letters* to Expreſs the

the Thing to the *Eyes* of him that is *Deaf*; by which others Expreſs the *Sound* or Name of It to thoſe that *Hear*. So that, indeed, that ſhall be, to Him, a *Real Character*, which Expreſſeth to another a *Vocal Sound*: but ſignifieth, to both, the ſame *Conception*; Which is, To *Underſtand the Language*.

Theſe were the Fundamental Grounds of Poſſibility in Nature: to which I Added the following Conſiderations, which made me think it Morally Poſſible; that is, not Impoſſible to ſucceed in Practice. I conſidered from how Few and Deſpicable Principles the whole Body of *Geometry*, by continual Conſequence, is Inforc'd: and if ſo Fair a Pile, and Curious Structure may be Raiſed, and ſtand faſt upon ſo ſmall a Bottom, I cou'd not think it Incredible, that we might Attain ſome Conſiderable Succeſs in this Deſign, how little ſoever we had at firſt to begin upon, and, from thoſe little *Actions* and *Geſtures*, which have a Kind of Natural Significancy, we might, if well manag'd, proceed Gradually to the Explication of a *Compleat Language*, and withal, Direct to thoſe Curioſities of *Motion* and *Poſture* in the *Organs* of *Speech*, requiſite to the *Formation* of a *Sound* Deſir'd; and ſo to Effect both parts of what we Intend. I was further encouraged by the Conſideration of the Perſon who was very Ingenious and Apprehenſive, and ſo far at leaſt a *Mathematician* as to Draw Pictures, whereby he was already accuſtom'd to Obſerve and Imitate thoſe little Niceties in a Face, without which it is not Poſſible to draw a Picture well. I ſhall add this alſo, that Once, he could have *Spoken*, though ſo long ago, that (I think) he doth ſcarce Remember it. But having (by Accident, when about 5 Years of Age Loſt his *Hearing*, he conſequently Loſt his *Speech* alſo; not all at once, but by degrees, in about half a Year's time, which tho' it do confirm what I was ſaying but now, How needful it is for the *Ear* to Guide the *Tongue* in *Speaking*, (ſince that Habit of *Speaking*, which was Attain'd by *Hearing*, was alſo Loſt with it,) and might therefore diſcourage the Undertaking; yet I was thereby very much Secured, that his want of *Speech* was but a Conſequent of his want of *Hearing*, and did not proceed originally from an Indiſpoſition in the *Organs* of *Speech* to Form thoſe *Sounds*.

But though I did believe it Poſſible for him to *Learn* ſo to *Speak* as to be Underſtood: yet I could not promiſe my ſelf, that he ſhould *Speak* ſo Accurately, but that a Critical Ear might eaſily Diſcern ſome Failures, or little Differences from the ordinary *Tone* or *Pronunciation* of other Men: Becauſe the Neglect of it in his Younger Years, when the *Organs* of *Speech*, being yet Tender, were more Pliable, might now render them leſs Capable of that Accurateneſs which thoſe of Children attain unto, whereof we have daily Experience, it being found very Difficult, if not Impoſſible, to Teach a Foreigner well in Years, the Accurate *Pronouncing* of that *Sound* or *Language*, which in his Tender Years he had not Learn'd. Beſides, the *Ear* being ſo neceſſary to Guide and Correct the *Tongue*, it is not reaſonably to be expected, that He who cannot *Hear*, though he may Know how to *Speak* Truly, ſhould yet perform it ſo Accurately, as if he had the Advantage of his *Ear* alſo.

Nor

Nor could I promiſe, nor indeed Hope, that how Accurately ſoever he might Learn to *Speak*, he ſhould be able to make ſo great uſe of it as others do: For ſince that he cannot *Hear* what others ſay to Him, as well as Expreſs his own Thoughts to them, he cannot make ſuch uſe of it in Diſcourſe as others may. And though it may be thought Poſſible, that he may in time Diſcern, by the *Motion* of the *Lips* Viſible to the *Eye*, what is ſaid to him, yet this cannot be expected, till at leaſt he be ſo perfectly Maſter of the *Language*, as that by a *Few Letters* Known, he may be able to ſupply the reſt of the *Word*; and by a few *Words* the reſt of the *Sentence*, or at leaſt the Senſe of it by a probable Conjecture, (as when we *Decipher* Letters written in *Cipher*) For, that the Eye can actually Diſcern all the Varieties of *Motion* in the *Organs* of *Speech*, and ſee what *Sounds* are made by thoſe *Motions*, (of which many are Inward, and are not Expoſed to the *Eye* at all,) is not imaginable. But as to the other Part of our Deſign, I ſee no Reaſon at all to Doubt, but that he might attain a *Language* and the *Elegancy* of it as Perfectly as thoſe that *Hear*.

The way I have taken towards this Deſign is in General ſufficiently Intimated already; As to that of *Speech*, I muſt firſt by the moſt Significant *Signs* I can, make him to Underſtand, in what *Poſture* and *Motion* I would have him apply his *Tongue*, *Lips*, and other *Organs* of *Speech*, to the Forming of ſuch a *Sound* as I direct. Which if he hit right, I confirm him in it: If he miſs, I ſignifie to him, in what he differed from my Direction; and to what Circumſtances he muſt attend to Mend it. And for this Work, I was ſo far Prepared before hand, that I had heretofore, upon another Occaſion, (in my Treatiſe *de Loquela*, prefixed to my *Grammar for the Engliſh Tongue*,) conſidered very exactly (what few attended to) the Accurate Formation of all *Sounds* in *Speaking*, (at leaſt as to our own Language, and thoſe I knew:) without which, it were in vain to ſet upon this Task. As to that of Teaching him the *Language*; I begin with that little Stock of ſuch *Actions* and *Geſtures* as have a kind of natural Significancy: and from them, or ſome Few *Signs* which himſelf had before taken up, to expreſs his Thoughts as well as he could, Proceed to Teach him, what I mean by ſomewhat elſe; and ſo, by ſteps, to more and more, And this, ſo far as well I can, in ſuch Method as that what he Knows already, may be a ſtep to what he next is to Learn.

He hath been already with me ſomewhat more than 2 *Months*: and the Succeſs is more than I did expect. There is hardly any *Word*, which (*with Deliberation*) he cannot *ſpeak*: And he hath already learned a conſiderable part of *Engliſh Words* of moſt frequent Uſe. So that I may ſay the greateſt difficulty of both Parts of the Undertaking is almoſt over: what Remains is little more than the Work of Time and Exerciſe.

A further Account by..... ib. p. 1098.

2. The Perſon to whom the foregoing Diſcourſe doth refer, is Mr. *Daniel Whaley*, Son of Mr. *Whaley* late of *Northampton*, and Mayor of that Town. He was Preſent at the Meeting of the *Royal Society May* 21. 1662. and did there to their great Satisfaction *Pronounce* Diſtinctly enough ſuch *Words* as by the Company were Propoſed to him; and though not altogether

together with the uſual *Tone* or *Accent*, yet ſo as eaſily to be Underſtood. About the ſame time alſo (his *Majeſty* having Heard of it, and being willing to ſee him) he did the like ſeveral times at *Whitehall*, in the Preſence of his *Majeſty*, his Highneſs *Prince Rupert*, and divers others of the Nobility. In the ſpace of a *Year*, which was the whole time of his ſtay with Dr. *Wallis*, he had *Read* over a great part of the *Engliſh Bible*, and had attained ſo much Skill as to *Expreſs* himſelf Intelligibly in Ordinary Affairs; to *Underſtand Letters* Written to him, and to *Write* Anſwers to them, though not Elegantly yet ſo as to be *Underſtood*: And in the Preſence of many Foraigners (who out of Curioſity have come to ſee him,) hath oft-times not only *Read Engliſh* and *Latin* to them, but *Pronounced* the moſt Difficult *Words* of their Languages (even *Poliſh* it ſelf,) which they could Propoſe to him.

The ſaid Doctor hath ſince done the like for Mr. *Alexander Popham* (a Young Gentleman of a very good Family, and a fair Eſtate,) who did from his *Birth* want his *Hearing*.

VI. In order to Teach a *Language* to a *Deaf* Perſon it is neceſſary in the *Firſt* Place that he be taught to *Write*. That there may be ſomewhat to Expreſs to the Eye, what the *Sound* (of *Letters*) Repreſents to the Ear.

'Twill *next* be very Convenient (becauſe Pen and Ink is not always at hand) that he be Taught how to *Deſign* each *Letter*, by ſome certain Place, Poſition, or Motion of a Finger, Hand, or other Part of the Body; (which may ſerve inſtead of *Writing*.) As for Inſtance, the 5 Vowels *a*, *e*, *i*, *o*, *u*; by Pointing to the Top of the 5 Fingers: and the other Letters *b*, *c*, *d*, &c. by ſuch other Place or Poſture of a Finger as ſhall be agreed upon.

After this; a *Language* is to be Taught the *Deaf* Perſon, by like Methods as Children are at firſt Taught a *Language*; (though the thing perhaps be not heeded.) Only with this Difference: Children Learn *Sounds* by the *Ear*; but the *Deaf* Perſon is to Learn *Marks* (of thoſe *Sounds*) by the *Eye*. But both the one and the other, do equally Signify the ſame Thing or Notions; and are equally (*Significantia ad Placitum*) of meer *Arbitrary* Signification.

'Tis then moſt Natural (as Children Learn the *Names* of Things) to furniſh him (by degrees) with a *Nomenclator*; containing a competent Number of *Names* of Things Common and Obvious to the *Eye*; (that you may Shew the Thing anſwering to ſuch a *Name*.) And theſe Digeſted under convenient *Titles*; and Placed under them in ſuch convenient Order (in ſeveral Columnes, or other Orderly Situation in the Paper,) as by their Poſition beſt to Expreſs to the *Eye*, their *Relation* or Reſpect to One another. As, *Contraries* or *Correlatives*, one over againſt the other; *Subordinates* or *Apurtenances*, under their Principals; Which may ſerve as a kind of *Local Memory*. Thus in *One* Paper, under the Title *Mankind*, may be placed, (not Confuſedly, but in Decent Order,) *Man*, *Woman*, *Child*, &c. and if you pleaſe the *Names* of ſome known Perſons; with Spaces left to be ſupply'd with other like *Names* or *Words*, as after there may be Occaſion. Then (in *Another* Paper) under the Title *Body*, may be Written (in like Convenient Or-

A Method of Inſtructing *Perſons* Deaf *and* Dumb *to* Speak *and* Underſtand *a* Language; *by* *Dr.* J. Wallis. *n.* 245. *p.* 353.

der) the *Parts* of the *Body*, as *Head*, (*Hair*, *Skin*, *Ear*,) *Face*, *Neck*, *Breaſt*, *Belly*, &c. with like Spaces, as before, for more to be Added, as there is Occaſion. And when he hath learn'd the Import of *Words* in each Paper, let him *Write* them in like manner in Diſtinct Leaves or Pages of a Book (prepared for that purpoſe) to Confirm his *Memory*, and to have Recourſe to it upon Occaſion. In a *Third* Paper you may give him the Inward Parts, as *Skull*, *Throat*, *Stomach*, *Heart*, *Lungs*, &c. In *Another* Paper, under the Title *Beaſt* may be placed the ſeveral *Kinds* of *Beaſts*, as *Horſe*, *Cow*, *Sheep*, *Hog*, *Dog*, *Hare*, &c. Under the Title *Bird* or *Fowl* the ſeveral *Kinds* of *Birds*; as *Hen*, *Duck*, *Gooſe*, *Kite*, *Lark*, &c. Under the Title *Fiſh*, put *Pike*, *Eel*, *Plaice*, *Salmon*, *Lobſter*, &c. You may then put *Plants* or *Vegetables*, under ſeveral Heads, or Subdiviſions of the ſame *Head*, as *Trees*, *Fruits*, *Flowers*, *Herbs*, *Corn*, &c. And the like of *Inanimates*, as *Heaven*, *Sun*, *Moon*, *Stars*, *Elements*; *Earth*, *Metals*, *Minerals*, *Waters*, *Air*, *Meteors*, *Fire*, *&c*, Under the Title *Cloaths*, put the ſeveral Sorts both *Woollen*, *Linnen*, &c. And under the Title *Houſe*, *Room*, &c. the *Parts*, *Furniture*, and *Utenſils* belonging thereunto. With Diviſions and Subdiviſions, as there is Occaſion. And in like manner from time to time may be Added more Collections or Claſſes of *Names* or *Words*, conveniently Digeſted under Diſtinct Heads, and ſuitable Diſtributions; to be Written in Diſtinct Leaves or Pages of his Book; in ſuch order as may ſeem moſt Convenient.

When he is furniſh't with a competent Number of *Names*, it will be Seaſonable to Teach him (under the Titles *Singular*, *Plural*, (the Formation of *Plurals* from *Singulars*; by adding *s* or *es*, *Hand*, *Hands*; *Face*, *Faces*; *Fiſh*, *Fiſhes*, &c. with ſome few *Irregulars*, as *Man*, *Men*; *Woman*, *Women*; *Foot*, *Feet*; *Mouſe*, *Mice*; *Ox*, *Oxen*, &c. which (except the *Irregulars*) will ſerve for *Poſſeſſives* (to be after Taught him,) which are Form'd from their *Primitives*, by like Addition of *s*, or *es*, except ſome few *Irregulars*; as *my*, *mine*; *thy*, *thine*; *our*, *ours*, &c. And in all thoſe, and other like Caſes, it will be Proper firſt to ſhew him the *Particulars*, and then the *General Title*.

Then Teach him in another Page or Paper the *Particles* as *a*, *the*, *theſe*, &c. And the *Pronouns*, as *I*, *Thou*, *He*, *They*, *Who*, &c. Then under *Adjective*, *Subſtantive*, Teach him to Connect theſe, as *My Hand*, *Your Head*, *Their Shoes*, &c. To furniſh him with more *Adjectives*, under the Title *Colours*, you may place *Black*, *White*, *Gray*, &c. and having ſhewed the Particulars; let him know, theſe are call'd *Colours*. The like for *Taſt*, *Smell*, *Hearing*, and *Touch* or *Feeling*. From whence you may furniſh him with Examples of *Adjectives with Subſtantives*, as *White Bread*, *Soft Cheeſe*, *My Black Hat*, &c. And then Inverting the order, *Subſtantive* and *Adjective*, (with the *Verb Copulative* between) as *Silver is White*, *Gold is Yellow*, *Lead is Heavy*, *I am not well*, &c. which will begin to give him ſome Notion of *Syntax*. In like manner, when *Subſtantive* and *Subſtantive* are ſo Connected. As *Gold is a Metal*, a *Roſe is a Flower*, *Larks are Birds*, &c. Then as thoſe before relate to *Quality*, you may give him ſome other Words relating to *Quantity*; as *Long*, *Short*, *Broad*, *Many*, *Full*, &c. Then

Words

Words of *Figure*, as *Straight*, *Round*, *Concave*, *Convex*, &c. Of *Geſture*, as *Stand*, *Sit*, &c. Of *Motion*, as *Move*, *Run*, *Fly*, *Creep*, &c. Then Words relating to *Time*, *Place*, *Number*, *Weight*, *Meaſure*, *Money*, &c. are (in convenient time) to be ſhewed him Diſtinctly; as likewiſe the Names and Situations of *Places* and *Countries*, which are convenient for him to Know. Which may be orderly Written in his Book, and ſhewed him in *Maps*, &c.

After the *Concord* of *Suſtantive and Adjective*, he is to be ſhew'd, (by convenient Examples) that of the *Nominative and Verb*; As for Inſtance, *I go*, *He Sits*, *the Fire Burns*: with the Titles on the Top, *Nominative*, *Verb*. After this, under the Titles *Nominative*, *Verb*, *Accuſatives*, give him Examples of *Verbs Tranſitives*; As, *You ſee me*, *the Firs burns the Wood*: Or even with a *Double Accuſative*; as, *You teach me (Writing, or) to Write*. After this you may Teach him the *Flexion* or *Conjugation* of a *Verb*; or what is equivalent thereunto. For in our *Engliſh Tongue*, each *Verb* hath but *Two Tenſes*, the *Preſent* and the *Preter*, and *Two Participles*, the *Active* and the *Paſſive*: All the reſt is perform'd by *Auxiliaries*. Which (*Auxiliaries*) have no more *Tenſes*, than the other *Verbs*. Thoſe *Auxiliaries*, are *Do*, *Did*; *Will*, *Would*; *Shall*, *Should*; *May*, *Might*; *Can*, *Could*; *Muſt*, *Ought to*; *Have*, *Had*; *Am*, (*Be*) *Was*: And if by Examples, you can Inſinuate the Signification of theſe Few Words, you will have Taught him the whole *Flection* of the *Verb*. And here it will be convenient, (once for all,) to Write him out a full *Paradigm* of ſome One *Verb*, (ſuppoſe, to *See*,) through all thoſe *Auxiliaries*. The *Verb* it ſelf, hath but theſe 4 Words to be Learn'd; *See*, *Saw*; *Seeing*, *Seen*; Save that, after Thou in the *Second Perſon Singular* (in both *Tenſes*) we add *eſt*; and, in the 3*d Perſon Singular* (in the *Preſent Tenſe*) *eth* or *es*; or inſtead thereof, *ſt*, *th*, *s*. And ſo in all *Verbs*. Then, to the *Auxiliaries*, *Do*, *Did*, *Will*, *Would*, *Shall*, *Should*, *May*, *Might*, *Can*, *Could*, *Muſt*, *Ought to*, we adjoyn the Indefinite *See*; And, after *Have*, *Had*, *Am*, (*Be*) *Was*, the Paſſive Participle *Seen*; And ſo for all other *Verbs*.

But the *Auxiliary*, *Am* or *Be*, is ſomewhat *Irregular*; in a Double Form; *Am*, *Art*, *Is*; Plural, *Are*. *Was*, *Waſt*, *Was*; Plural *Were*.

Bee, *Beeſt*, *be*; Plural *Be*. *Were*, *Wert*, *Were*; Plural *Were*.

Be, (*Am*) *Was*; *Being*, *Been*.

Which (attended with the other *Auxiliaries*) make up the whole *Paſſive Voice*.

All *Verbs*, (without Exception) in the *Active Participle*, are Form'd by adding *ing*; As, *See*, *Seeing*; *Teach*, *Teaching*; &c. The *Preter Tenſe*, and the *Paſſive Participle*, are Form'd (Regularly) by adding *ed*. But are oft ſubject to *Contractions*, and other *Irregularities*, (ſometimes the Same in both; ſometimes Different.) And therefore it is convenient here, to give a Table of *Verbs* (eſpecially the moſt Uſual) for thoſe *Three* Caſes. (Which may at once Teach their Signification, and their Formation,) as, *Boil*, *Boiled*, *Boiled*; *Bake*, *Baked*, *Baked*; &c. *Teach*, *Taught*, *Taught*; *Buy*, *Bought*, *Bought*, &c. *Give*, *Gave*, *Given*; *Write*, *Wrote*, *Written*; &c.

The *Verbs* being thus Diſpatch'd; he is then to Learn the *Prepoſitions*; Wherein lies the whole *Regimen* of the *Noun*. (For Diverſity of *Caſes*, we have none.) The Force of which is to be Inſinuated by convenient Examples, ſuited to their Different Significations; As, for Inſtance *Of*; *A Piece of Bread*; *A Cup of Water*; *A Pint of Wine*; &c. And in like manner, for *ff*, *On*, *To*, *From*, *At*, *In*, *By*, &c. And by this time he will be pretty well enabled to Underſtand a Single Sentence.

In the laſt place, he is (in like manner) to be Taught *Conjunctions*, (Which ſerve to Connect, not *Words* only, but *Sentences*;) As, *And*, *If*, *But*, *Becauſe*, *Therefore*, &c. and theſe Illuſtrated by convenient Examples; as, *Becauſe* I am Cold, *Therefore* I go to the Fire; *That* I may be Warm; *For* it is Cold Weather.

By this Time his Book (if well furniſh'd with Plenty of Words; and thoſe well Digeſted, under Several Heads, and in Good Order; and well Recruited from time to time as New Words occur;) will Serve him in the Nature of a *Dictionary* and a *Grammar*. And in Caſe the *Deaf* Perſon be otherwiſe of a Good Natural Capacity, and the Teacher of Good Sagacity; By this Method (proceeding gradually, Step by Step,) you may (with Diligence and due Application, of Teacher and Learner,) in a *Year*'s Time or thereabouts, perceive a greater Progreſs than you would expect: and a good Foundation laid for further Inſtruction, in Matters of *Religion*, and other *Knowledge*, which may be Taught by Books.

It will be convenient, all along, to have Pen, Ink, and Paper, at hand, to Write down in *Words*, what you Signify to him by *Signs*; and cauſe him to Write (or ſhew him how to Write) what he ſignifies by *Signs*: Which way (of Signifying their Mind by *Signs*) *Deaf* Perſons are often very Good at. And we muſt endeavour to Learn their Language (if I may ſo call it) in order to Teach them ours: by ſhewing what *Words* anſwer to their *Signs*. 'Twill be alſo convenient, as you go along, (after ſome convenient Progreſs made,) to Expreſs, in as plain Language as may be, the Import of ſome of the Tables. As for Inſtance, The *Head* is the *Higheſt Part* of the *Body*; The *Feet* the *Loweſt Part*; The *Fore-head* is *Over* the *Eyes*; &c. And ſuch Plain Diſcourſe, put into *Writing*, and particularly Explain'd, will Teach him by Degrees to Underſtand Plain Sentences. And like Advantages, a Sagacious Teacher, may take as Occaſion offers it ſelf from Time to Time.

This is the *Method* I uſed with Good Succeſs about 34 Years ago, when I Taught Mr. *Alexander Popham*, who was Born *Deaf*, to *Speak* Diſtinctly, and to *Underſtand a Language*, ſo as to *Expreſs* his Mind (tolerably well) by *Writing*, and to *Underſtand* what was *Written* to him by others; As I had, before, Taught Mr. *Daniel Whaley*.

VII. *A Paper of Leſs General Uſe*, Omitted. *viz.*

A *Catalogue* of ſome *Indian* and *Chineſe Manuſcripts*, which were ſent to Dr. *Arthur Charlett* and the Late Dr. *Edw. Bernard*, by Mr. *George Lewis* from *Fort St. George*, in 1698. *Theſe Curious Manuſcripts being ſhown to the* Royal Society *by the Favour of Dr.* Charlett, *it Appeared by a* Sample *or* Specimen *of the Leaves and Fruit of the* Ampana *Hort. Mal. Tom.* 1. *p.* 13. *Fig.* 10. *Or* Palma Malabrica, Floſculis Stellaris, Fructu Longo Squammato *D. Syen. ib. Or* Palma Coccifera Folio Plicatili Flabelli-formi major. Ampana *H. M. Rai Hiſt. p* 1366. *brought to the* Society *by Mr.* James Petiver, *that the ſeveral* Leaves *of all theſe* Books *were made of the* Leaves *of this* Palm *Wrote on by a* Stile. *n.* 246. *p.* 421

VIII. *Accounts of Books*, Omitted.

1. *Petri Lambecii* Lib. Primus Prodromi *Hiſtoriæ Literariæ*. *n.* 30. *p.* 575.

2. A Diſcourſe touching the *Original* of *Humane Literature*, both *Philology* and *Philoſophy*; in Two Parts: by *Theop. Gale*, M. A. *Ox.* 1669. and 1671 *in* 4*to*. *n.* 74. *p.* 223.

3 Reflections upon *Ancient* and *Modern Learning*; by *W. Wotton*. B. D. *Lond.* 1694. *in* 4*to*. *n.* 214. *p.* 264.

4. *Librorum Manuſcriptorum* Academiarum *Oxonienſis* & *Cantabrigienſis*, & Celebrium per *Angliam*, *Hiberniamque* Bibliothecarum Catalogus: cum Indice Alphabetico. Cura *Edw. Bernardi.* Tomi Dnobus *in Fol. The Account of this Book is here Enlarged, and ſeveral Inſtances given of the great* Uſefulneſs *of ſuch* Catalogues. *n.* 211. *p.* 160. *n.* 247. *p.* 442.

5. Syſtema *Bibliothecæ* Collegii *Pariſienſis Soc. Jeſu*. A *Paris*. 1678. *in* 4*to*. *n.* 140. *p.* 1012.

6. *Juli Pflugk* Equitis *Saxonici* Epiſtola ad perilluſtrem *atque* Generoſiſſimum Virum *Ludovicum à Seckendorff*, Virum de utraque Republica Meritiſſimum, præter fata *Bibliothecæ Budenſis*; *Librorum* quoque in ultima Expugnatione Repertorum *Catalogum* exhibens. *Jen.* 1688. *in* 8*vo*. *n.* 243. *p.* 305.

7. Of *Education*, eſpecially of *Young Gentlemen*; In 2 Parts; The 2*d*. *Impreſſion* with *Additions*. *Oxon. in* 8*vo*. *n.* 123. *p.* 572.

8. *Alphabetum Naturæ*, Auth. F. M. *B. V. Helmont*. 1667. *n.* 31. *p.* 602.

9. Diſcourſe Phyſique de la *Parole*, par M. *De Cordemoy*; a *Paris in* 120. *Tranſlated into* Engliſh. *Lond.* 1668. *in* 120. *n.* 37. *p.* 736. *n.* 39. *p.* 788.

10. Elements of *Speech*: An Eſſay of Enquiry into the Natural Production of *Letters*; together with an Appendix to *Inſtruct* Perſons *Deaf* and *Dumb*: by *Will. Holder*. D. D *Lond.* 1669. *in* 8*vo*. *n.* 47. *p.* 958.

11. An Eſſay towards a *Real Character*, and a *Philoſophical Language*; by *Jo. Wilkins*. D. D. *n.* 35. *p.* 690.

12. A *Grammar* of the *Engliſh Tongue* in *Fol.* by Dr. *Jo. Wallis*. To which is prefixed a Treatiſe *de Loquela* by the ſame Author. 1653. *n.* 61. *p.* 1099.

13. A

n. 82. p. 4054. 13. A Short Eſſay directing how to Divide a *Period* into *Sentences*; with what *Points* the *Sentences* ſhall be *Diſtinguiſht*, &c, by *M. Lewis*.

n. 110. p. 235. 14. An Eſſay to Facilitate the *Education* of *Youth*, by bringing down the Rudiments of *Grammar* to the Senſe of *Seeing*; which ought to be Improv'd by *Syncriſis*, fitted to Childrens Capacities, for the Learning eſpecially of the *Engliſh*, *Latin* and *Greek Tongues*: In 3 Parts; An *Accidence*, a *Middle Grammar*, and a *Critical* or *Idiomatical Grammar*. By Mr. *Lewis* of *Tottenham*. *Lond. in* 8*vo*.

n. 48. p. 975. 15. An Examen of the way of *Teaching* the *Latin Tongue* by *Uſe* alone. *Engliſh'd* out of *French*. *Lond.* 1669. *in* 120.

n. 48. p. 973. 16. An Hiſtorical Eſſay endeavouring a Probability, That the *Language* of *China* is the *Primitive Language*; by *Jo. Webb*, Eſq; *Lond.* 1669. *in* 8*vo*.

n. 140. p. 1013. 17. *Gloſſarium* ad Scriptures *Mediæ* & *Infimæ Latinitatis*, In quo *Latina Vocabula Novatæ* Significationis explicantur: complures *Ævi Medii Ritus* & *Mores*; *Legum*, *Conſuetudinum Municipalium*, & *Juris-Prudentiæ* Recentioris *Formulæ* & *Obſoletæ* Voces; utriuſque Ordinis *Eccleſiaſtici* & *Laici Dignitates* & *Officia*; *&c.* Enucleantur, & Illuſtrantur: Innumera denique Scriptorum Loca, *Græcorum*, *Gall. Lat. Ital. Hiſpan. German. Anglo-Sax.* Expenduntur, Emendantur, Elucidantur Auth. *Carolo du Freſne*. A *Paris*. 1678. *in Fol.* 3 *Vol.*

n. 126. p. 642. 18. De l' *Art de Parler*; a *Paris*. 1675. *in* 120.

n. 93. p. 6024. 19 De *Pocmatum Cantu* & Viribus *Rythmi*. *Oxon.* 1673. *in* 8*vo*.

n. 227. p. 522. 20. Λυκοφρόνος τῆς Χαλκίδεως Αλεξάνδρα. *Lycophronis Chalcidenſis Alexandra*; cum *Græcis Iſacii Tzetzis* Commentariis. Accedunt Verſiones, Variantes Lectiones, Emendationes, Annotationes, & Indices neceſſarii. Cura & Opera *Joh. Potteri*. A. M. *Oxon.* 1697.

n. 54. p. 1093. 21. *Athanaſii Kircheri* Ars Magna *Sciendi* ſive *Combinatoria*. *Amſtel.* 1669. *in Fol.*

n. 106. p. 139. 22. *Logica*, ſive *Ars Cogitandi*; è Tertia apud *Gallos* Editione Recognita & Aucta, in *Latinum* Verſa. *Lond.* 1674. *in* 8*vo*.

CHAP. II.

Chronology. Hiſtory. Antiquities.

To Find the Year of the Julian Period; *by R. P. De Billy.* n. 18. p. 324.

I. 1. MUltiply the *Solar Cycle* by 4845. and the *Lunar* by 4200. and that of the *Indiction* by 6916. Then Divide the Sum of the Products by 7980. which is the *Julian Period:* The Remainder of the Diviſion, without having regard to the Quotient, ſhall be the *Year* of the *Julian Period* Required. *e. g.* Let the *Cycle* of the *Sun* be 3; of the *Moon* 4; and of the *Indiction* 5. Multiply 3 by 4845, and you have 14535; and 4 by

by 4200, comes 16800; and 5 by 6916, comes 34580. The Sum of the Products is 65915: which being Divided by 7980, gives 8 for the Quotient, and the Number 2075, which Remains, is the *Year* of the *Julian Period.*

2. The *Julian Period* is a Basis, whereon to found *Chronology* not Liable to Controversy, as the *Age* of the *World* is: And 'tis the Number above-said, to wit, 7980, which is the Product of 28, (the *Solar Cycle*) x 19, (the *Lunar Cycle*) x 15, (the *Indiction*). This *Period* (first Invented by *Robert Lotharing*, Bishop of *Hereford*, and 500 Years after fitted for *Chronological* Uses by *Joseph Scaliger*) is such a Limit to *Chronology*, that within the Space of 7980 Years, the Number of the *Sun's Cycle*, the *Prime* and the Year of the *Roman Indiction* (which relates to their Ancient Laws and Records) can never happen alike. And these Remarks being given, the Year of the *Julian Period* is by the Former Rule infallibly Found. *Demonstrated by Mr.* J. Collins. n. 30. p. 563.

The Problem it self may be thus proposed; *Any Number of* Divisors, *together with their* Remainders *after* Division, *being proposed to find the* Dividend.

This Problem thus Generally Proposed was Resolv'd long since by *John Geysius*, by the help of particular Fix'd Multipliers: and to Clear up what Authors have Omitted concerning them, we say that Each of these *Multipliers* is Relative to the *Divisor* to which it belongs, and thus Define it; *It is such a Number, as* Divided *by the rest of the* Divisors, *or their* Product, *the* Remainder *is* ø; *but* Divided *by its own* Divisor, *the* Remainder *is an* Unite.

We Require the *Divisors* proposed to be *Primitive* each to other, *i. e.* that no Two or more of them can be Reduc'd to Lesser Terms by any *Common Divisor*: For if so, the Question may be Possible in it self, but not Resolvable by Help of such *Multipliers*, such being Impossible to be Found. The Reason is, because the *Product* of an Odd and Even Number is always Even, and that Divided by an Even Number, Leaves either Nothing, or an Even Number.

Divisors. 28, 19, 15 } The *Multipliers* Relative thereto are { 3845. 4200. 6916.

The *Definition* affords Light enough for the Discovery of these Numbers. To instance in the *First*; The *Product* of 19 and 15 is 285, which *Multiply* by all Numbers successively, and *Divide* by 28, till you find the *Remainder* Required. Thus *Twice* 285 is 570, which *Divided* by 28, the *Remeinder* is 10; also *Thrice* 285 is 855, which Divided by 28, the *Remainder* is 15. Thus if you Try on Successively, you'll find, that 17 *times* 285, which is 4845, is the Number Requir'd, the which *Divided* by 28, the *Remainder* is an Unite. Hence then we shall find.

4845

$$\left.\begin{matrix}4845\\420\\6916\end{matrix}\right\}\text{is Equal to the Solid or Product of}\left\{\begin{matrix}19,\ 15,\ 17.\\28,\ 15,\ 10.\\28,\ 19,\ 13.\end{matrix}\right.$$

For the *Demonstration* of the *Theorem* Propos'd we thus argue.

1. *Each* Multiplier *Multiplied by its* Remainder, *is Measured or* Divided, *by its own* Divisor, *leaving such a* Remainder *as is Proposed.* For before, each *Multiplier* was Defin'd to be a *Multiplex* of its own *Divisor*, *plus* an *Unit*. Wherefore *Multiplying* it by any *Remainder*, it doth only render it a greater *Multiplex* in the said *Divisor*, *plus* an *Unit Multiplyed* by the *Remainder*; which is no other than the *Remainder* it self: but if 0 *Remain*, that *Product* is Destroyed.

2. *The* Sum *of the* Products, Divided *by each respective* Divisor, *have the* Remainder *assigned.* For concerning the First *Product*, it is by the First Section Measur'd by its own *Divisor*, leaving the *Remainder* proposed; and if we add the rest of the *Products* thereto, we only Add a *Multiplex* of its own *Divisor*, which in *Division* enlargeth the *Quote*, but not the *Remainder*. Particularly the *Second Multiplier* is 28 x 15 x 10 x *Remainder*, all which is but a *Multiplex* of 28. And so the 3*d*. *Product* is 28 x 19 x 13 x *Remainder*. And what hath been said concerning the *Sum* of the *Products*, being *Divided* by the *First Divisor*, and leaving the *Remainder* thereto Assign'd, may be said of Each respectively.

3. *The* Sum *of* Products, Divided *by the* Solid *of the* 3 Divisors, *leaves a* Remainder *so Qualify'd as the said* Sum. For concerning the said *Sum*, 'tis Evident by the *Second hereof*, that it is no other than the *First Product*, Increased by adding a just *Multiplex* of the *First Divisor*, that thereby we did only Enlarge the *Quote*, not Alter the *Remainder*; By the like Reason, the *Subtracting* a just *Multiplex* thereof, doth only Alter the *Quote*, not the *Remainder*; But the *Solid* of all 3 *Divisors*, Multiplied here by the *Quote*, as there by the *Remainder*, is no other than a just *Multiplex* of the *First Divisor*. Wherefore the *Remainder*, after this *Division* is perform'd, is of the same Quality as the *Sum* of the *Products*: and *Divided* by the *First Divisor*, leaves the *Remainder* proper thereto. And the like may be said concerning each *Divisor*.

As in the Method hitherto deliver'd, we requir'd the *Divisors* be *Primitive* to each other: so, if we take the *Problem* as Generally Proposed, in the Preface to *Helvicus* his *Chronologia*, we are told, *Common Arithmetick* Fails in the Solution thereof; and *Tacquet* Denies it to be Performable by the *Regula Falsi*, and being Unlimited, we must do it by Tryals. Wherefore, *When any Two* Divisors *with their* Remainders *are Proposed, Try the* Multiplices *of one of them, Increased by its* Remainder, *and* Divide *by the other: If you find such* Remainders *as are not for the purpose, and that they are Repeated, the* Problem *is* Impossible.

Example. Divisors. $\left\{\begin{matrix}6.\\8.\end{matrix}\right\}$ Remainders $\left\{\begin{matrix}3.\\5.\end{matrix}\right.$

The

The *Multiplices* of 8, Increaſed by 5, are 13. 21. 29. 37. 45. 53.
Thoſe *Divided* by 6, the *Remainders* are, 1. 3. 5. 1. 3. 5.
Here you ſee 21. and 45 for the Purpoſe, and take the *Progreſſion*, adding the Common Difference 24 (which is the leaſt *Dividend* Meaſur'd by 6 and 8) and you have 21. 45. 69. 93. 117. 141.
Admit the Queſtion had concern'd theſe 3 *Diviſors*:

6, 8, 9 } The Remainders being { 5, 3, 6 | Then *Dividing* the former *Progreſſion* by 9, the *Remainders* are 3. 0. 6. 3. 0. 6.

Wherefore I Conclude, that the 3*d* and 6*th* of theſe Numbers are thoſe Sought, to wit, 69 or 141. and ſo on Progreſſively; whereas, if you had Propounded the *Remainder* of 9 to have been any other Number, than 3. 0. 6. the *Problem*, as concerning all Theſe, had not been Poſſible.
Some eaſy *Caſes* of the *Problem* are theſe: When the *Remainder* of ſome *Diviſor* is 0, and of each of the reſt of the *Diviſors*, an *Unit*, or leſs by an *Unit* than the *Diviſor*. In which *Caſes* you are to Find ſuch a *Multiplex* of the *Product* or leaſt *Dividend* Meaſurable by thoſe *Diviſors* that have *Remainders*, which Increaſed or Diminiſhed by an *Unit*, may be a juſt *Multiplex* of that *Diviſor* that hath no *Remainder*.

II. 1. To find the Year of the *Julian Period* for any *Year of our Lord* propoſed, It is neceſſary to be Furniſh'd with the *Prime*, *Cycle* of the *Sun*, and the *Number* of the *Roman Indiction*, which the Induſtrious Mr. *Street* thus performs:

Several Chronological *Problems*, *Solv'd*; *by Mr.* J. Collins. *n.* 30. *p.* 372.

When 1. 9. 3. *to the* Year *hath Added been*,
Divide *by* 19. 28, Fifteen.
The *Remainders* are the Numbers ſought.

To find the Prime, Solar Cycle, *and* Indiction.

The Uſe of the *Prime* is, to Find the *Epact*, and thereby the *Moon's Age*, *Time* of *High Water*, &c.

2. A farther Uſe of the *Sun's Cycle*, is to attain the *Dominical Letter*, and thereby *To know the* Day *of the* Week, *on which any* Day *of the* Month *happens*. But this is more eaſily and with leſs Caution obtain'd, by finding on what *Day* of the *Week* the *Firſt of March* happens for ever; In brief thus:

To find what Day *of the* Week *any Day of the* Month *happens.*

To the Number Two *Add the* Year of our Lord *and its* Even 4th Part, *neglecting what Remains, if any*; *then* Divide *that* Sum *by* 7, *and the* Remainder (*neglecting the* Quotient) *ſhews the Number of the* Day *of the* Week, *accounting* Sunday *Firſt*. If 0 remain, the *Firſt* of *March* falls on a *Saturday*. Thus 2 + 1669 + 417 = 2088. being *Divided* by 7, the *Remainder* is 2: ſhewing the *Firſt Day* of *March* in the Year 1669. to fall on a *Munday*. If it were Required to perform this for Years Preceding our *Saviour's Nativity*, then take this Rule:

To the Year *Add its* Even 4th Part, *the* Sum Divided *by* 7, *the* Remainder *ſhews the* Day of the Week, *accounting* Sunday *Firſt*, Saturday *Second*, *and ſo* backward.

3. *To find what* Day *of the* Month *in the* First Week *of each* Month, *happens to be on the* Same Day *of the* Week *as the* First *of* March. Use the (Plain) following Verses, in which the 12 *Words* relate to the 12 *Months* of the *Year*, accounting *March* the *First*.

Ask Endless Comfort, God Enough Bestows,
From Divine Axioms Faith Confirmed Grows.

The Alphabetical Number of the *First* Letter of the *Word*, proper to the *Month* Proposed, is the Answer. *e. g.* If the *Month* were *April*, the *Word* proper thereto is *Endless*, and E is the *5th Letter* in the Alphabet. Wherefore Conclude, that the *1st* of *March* and the *5th* of *April* do for ever Happen on the same *Day* of the *Week*.

4. *To find on what* Day *of the* Week *the* First Day *of each* Month *happens, supposing the* First *of* March *known*. It might be Reckon'd from the former Problem, but the following *Verses*, beginning with *March* as the former, is more Ready for the Purpose.

A Dreadful Fire, Beholders Daily Gaze,
Chastized England. *Ah Cruel Fatal Blaze.*

Example. In the *Year* 1669, the *First* of *March* is *Monday*; I would Know on what *Day* of the *Week* the *First* of *October* happens. The *Word* proper to the *Month* is *England*; then Count Alphabetically to *E*, *viz.* A. *Monday*; B. *Tuesday*; C. *Wednesday*; D. *Thursday*; E. *Friday*; which is the Day sought.

Whence Conclude, that the *1st*, *8th*, *15th*, *22d*, *29th*, Days of *October* are all *Fridays*. Thence it is easy to Reckon, on what *Day* of the *Week* any Day of that *Month* Happen'd; and so for all other Months.

The Sun's *Entrance into any* Sign. *Ib. p.* 574.

5. *To find on what* Day *of the* Month *the* Sun *Enters into any* Sign *of the* Zodiack; *ex superabundanti*, we give the following Verse.

Charles Brought Content, Divers Effects Ensue,
Envy, Fear, Dolour, Danger, Birds Adieu.

Here again the 12 *Words* relate to the 12 *Months*, *March* being the *First*. To the Number of the *Letters* of the Alphabet the *Word* Begins with Add 7. *e. g. Fear* is the *Word* for *October*, and F, the *6th* Letter: wherefore the *Sun* Enters into the *8th Sign*, to wit, *Scorpio* on the 13 of *October*.

The Rubricks *for the Seat of* Easter, *according to the* Julian Account, *explain'd; by Dr.* J. Walis. *n.* 240. *p.* 185.

III. The Fundamental Rule of the *Nicene Council* (which we pretend to follow) for the Keeping of *Easter*, is to this Purpose; *Easter-Day* is to be that *Sunday* which falls *upon*, or *next after*, the *First Full Moon* which happens next after the *Vernal Equinox*. This *Vernal Equinox* was *then* observ'd to fall on 21 of *March* though it does now fall on the 11*th* of *March*, or sometimes on the 10*th* of *March*. And therefore instead of *next after* the *Vernal Equinox*, we say, *next after* 21 *March*. But

But then it is ſaid (by a Miſtake I ſuppoſe) *after the Firſt Full-Moon*, inſtead of *upon, or next after* the *Firſt Full-Moon*, (for ſo it is to be underſtood) and added, *and if the Full-Moon happens on a Sunday, Eaſter Day is the Sunday after*; Which muſt needs be a *Miſtake*: For in ſuch Caſe, it is to be *that Sunday*, not the *Sunday after*. And ſo the Tables agree (contrary to this Note) both that *for* 40 *Years*, and that *to find Eaſter for ever*. And ſo it was Obſerv'd in the Years 1668, 1678, and 1682. And ſo whenever the Caſe happens, that the *Eccleſiaſtical Full-Moon* falls on a *Sunday*.

The only Doubt remains on what Day we muſt reckon the *Eccleſiaſtical Full-Moon* to fall. For we are not to judge either the *Equinox* or the *Full-Moon*, according as they happen in the *Heavens*, or in our *Almanacks*; but according to the *Paſchal Tables*, fitted to the Time of the *Nicene Council*. And accordingly we are to account the *Equinox* to be now (as then it was) on *Mar.* 21. The *Golden Number* (fitted to the *Cycle* of 19 Years; after the end of which it begins again, at 1, 2, 3, *&c.*) is placed in the Firſt Column of our *Calendar*, to Tell us on what Day (of ſuch a Year) the *New-Moon* is *ſuppoſed* to happen, in each Month; and the 15*th* Day of that *Moon* is *Reputed* the *Full*. Thus the *Golden Number* for the Year 1698, is 8. (That is, this is the 8*th* Year of ſuch *Decem novenal Cycle*, or Circle of 19 Years; commonly call'd *Cyclus Lunaris*, or the *Circle* of the *Moon*; as the other *Circle* of 28 Years is call'd, *Cyclus Solaris*, the *Circle* of the *Sun*, or rather of the *Sunday-Letter*.) And this Number 8 ſtands in the Calendar at *Mar.* 6. which we muſt therefore ſuppoſe to be *New-Moon*: (Though the *New Moon* were indeed *Mar.* 2.) Now *Mar.* 6. being the *New-Moon*, or *Firſt* Day of the (*reputed*) *Lunar Month* (for ſuch Year) *Mar.* 20. will be the 15*th* Day, or the (*reputed*) *Full-Moon* for the Month of *March* this Year, which happens to be *Sunday*; the *Dominical Letter* for this Year being *B*. But this happening before *Mar.* 21. (the *Suppoſed Equinox*) cannot be the *Paſchal Full-Moon*; but we muſt wait for Another. And we ſhall then find the *Golden Number* 8. ſtanding at *Apr.* 5. for the *New-Moon* of *April*, the ſame Year. And therefore the *Full-Moon*, or 15*th* Day of that (*reputed*) *Lunar Month*, is to be *Apr.* 19. Which being *Tueſday*, the *Sunday* next following is *Apr.* 24. (where ſtands *B*, the *Sunday Letter* for this Year) which is therefore to be *Eaſter-Day*, according to the *Intent* of theſe *Tables*; and it was Obſerved accordingly.

But it were to be Wiſhed, there had been ſomewhere a *Rubrick*, to Direct How we are to Find this (*reputed*) *Full-Moon*; and what is the Uſe of the *Golden Number*.

The Difference of the *Eccleſiaſtick* Account, in the *Paſchal Tables*, from that of the *Heavens* (both as to the *Equinox* and as to the *Full-Moons*) doth ariſe from hence:

1 The *Common Julian Year* (by which we Reckon) of 365 *Days* and 6 *Hours*, is ſomewhat too *Long*; being about 11 *Minutes* of an *Hour* Longer than the True *Solar* Year. By Reaſon whereof, the *Equinox* (and other *Annual* Seaſons) go forwards about 11 *Minutes*, every Year. Which from the

Time of the *Nicene Council*, till Now, amounts to about 11 *Days*, ſo that the *Equinox* which *then* happen'd *March* 21. is *now* come back to *our Mar.* 10. Which upon Pope *Gregory*'s Reforming the *Roman Calendar* (above 100 Years ſince) cauſeth the Difference of 10 Days, between what we call the *New-Stile* and the *Old-Stile*.

2. It was *then* ſuppoſed, that in 19 Years (which is the Compaſs of the *Golden Number*) the *Lunations* (of *New-Moon* and *Full-Moon*) did Return to the ſame Day and Hour, as they were 19 Years before. But though this be pretty near the Truth, yet it comes ſhort by about an *Hour and half*: which *Hour and half*, in every 19 Years, doth ſince that time, amount to 4 or 5 Days. Whence it comes to paſs, that the *Reputed Full-Moon* is *Later*, by 4 or 5 Days, than that of the *Heavens*. But our *Eaſter*, is Reckon'd according to the *Reputed Full-Moons* (derived from the *Golden Number*) not according to thoſe of the *Heavens*.

A Report of the Conſultation upon Mr. Dee's Propoſal for Reforming the Calendar A. 1582; by the Lord Treaſurer Burleigh. *n. 257. p. 355.*

IV. 1. It was Agreed by Mr. *Digges*, Mr. *Savile*, and Mr. *Chambers*, that upon their ſeveral peruſal of the Book written by Mr. *Dee*, as a Diſcourſe upon the *Reformation of the Vulgar Calendar* for the *Civil* Year, that they do Allow of his Opinion, that whereas in the late *Roman Calendar Reform'd* there are 10 *Days* cut off, to Reduce the *Civil* Year, to the State it was eſtabliſhed in at the *Council of Nice*, the Better *Reformation* had been to have cut off 11 *Days*, and to have Reduc'd the *Civil* Year, according to the State it was in at the *Birth of Chriſt*. And ſo they all Agree, that ſuch a *Reformation* had been more Agreeable to the *Account of Chriſt*. And ſo they do alſo Aſſent, that having Regard to the *Council* of *Nice*, the Subtraction of 10 *Days*, is Agreeable to Truth. And therefore the better to Agree with all Countries adjacent, that have receiv'd their *Reformation* of Subſtracting 10 *Days* only, they think it may be Aſſented unto without any Manifeſt Error: Having Regard to Obſerve certain *Rules* Hereafter, for Omitting ſome *Leap-years* in ſome Hundred Years. And for the *Subſtracting* of 10 *Days*, Mr. *Dee* has Compiled a Form of a *Calendar*, beginning at *May*, and ending at *Auguſt*, wherein every of theſe 4 Months, *May*, *June*, *July*, *Auguſt*, ſhall have in the Ends of them ſome Days taken away without Changing of any *Feaſt* or *Holy-Day*, Movable or Fix'd, or without altering the *Courſes* of *Trinity-Term*: that is to ſay, *May* to conſiſt of 28 *Days*, taking from it 3 *Days*; *June* to have 29 *Days*, taking from it but 1 *Day*; *July* to conſiſt of 28 *Days*, taking from it 3 *Days*; *Auguſt* to conſiſt of 28 *Days*, taking from it 3 *Days*: All which Days *Subſtracted* make 10 *Days*. In the which 4 Months no *Feſtival Day* is Changed, but remain upon the accuſtom'd *Days* of their Months.

And becauſe the *Roman Calendar* hath Joyn'd to it a great Company of *Rules*, of which only are Capable the *Skillful Computiſts* or *Aſtronomers*, it is thought Good to make a ſhort Table like an *Ephemerides*, to Continue the Certainty of all the *Feaſts Moveable*, Depending only upon *Eaſter*, and Agreeing with the *Roman Calendar*: which may ſerve for *One Hundred* or *Two Hundred Years*; and ſo be eaſily Renewed, when there ſhall be Occaſion for it.

2. The

2. The *Reformation* of the *Roman Calendar*, propoſed by Mr. *Dee*, as I cannot wholly Approve, ſo I cannot altogether Diſapprove. For I like the *Subſtraction* of 10 *Days*, as the *Church of Rome* has done, beginning the *Computation* from the *Council of Nice*: though it cannot be Deny'd, but that the *Reformation* from the Time of *our Saviour* had been much Better. But ſince the *Fathers* of the *Council* of *Nice* thought it more Wiſdom to look forwards, than to look Backwards, and to have greater Care of avoiding Diſtractions in the Church, about the *Celebration* of *Eaſter* for the Future, than to Remedy the Errors paſt: I think we ſhall do well, with the *Church* of *Rome* to follow their Example. And whereas ſome have thought of a more Exact Calculation, than this *Emendation*, introduc'd by Pope *Gregory* the XIII. which they ground upon the late *Aſtronomical* Obſervations of the Learn'd *Tycho Brahe*: yet ſince the Difference is not ſo great, as to make any ſenſible Error in many Ages, and ſince that Error may be eaſily Corrected by the Omiſſion of an *Intercalary Day*, I think it not fit for ſo ſmall a Nicety to make a new Diſſenſion in the Church. Much leſs am I of their Opinion, who think that this Correction of the Year is Therefore to be Rejected, becauſe it comes recommended by the *Church of Rome*: which were all one as to Refuſe ſome Wholſome Potion, becauſe it is Preſcrib'd by a Phyſician whoſe Manners we approve not of.

Conſider'd A. 1645; *by Mr.* J. Greaves. *Ib. p.* 356.

But I cannot Subſcribe to his Opinion, that this *Reformation* ſhould be by the *Subſtraction* of 10 *Days* out of *one* Year alone. For tho' I grant, that this were a quick Cure of a Lingring Diſeaſe, yet it is againſt all Rules of Art in Curing one Malady to make 10. For it cannot be, but that the *Defalcation* of 10 *Days* in *one* Year muſt be of Infinite Diſturbance in the Common-wealth in all *Contracts*, where neceſſarily a certain Time is Defin'd. I ſhall therefore Humbly recommend to his *Majeſty*'s Wiſdom and Favourable Conſideration, that Courſe which was long ſince Propoſed by many Able Mathematicians to Pope *Gregory*, upon the firſt notice of his Purpoſe of *Correcting* the *Calendar*. The manner was this; That for 40 *Years Space* there ſhould be no *Biſſextile* or *Intercalary Years*, or as we call them *Leap Years*, Inſerted in the Calendar. By which Courſe it is moſt Evident, that 10 *Days* will be *Subſtracted* in 40 Years, and theſe 40 Years will be each of them *Anni Æquabiles*, conſiſting of 365 Days, as our Common and Ordinary Years do, without any Alteration in the Whole Year. And this being beyond all Exception, had been readily entertain'd by Pope *Gregory*, had not his *Ambition* been greater than his Judgment; for He was willing to have the Honour of this *Emendation*, and not to Leave it to his Succeſſors; whereby the Year ever ſince has been call'd *Annus Gregorianus*.

3. Againſt this Expedient of *Obſerving No Biſſextile* for the *Space of* 40 *Years*, or now of 44 *Years*, there ſeems to me this great Objection. In the Time of *Julius* and *Auguſtus Cæſar*, there was a Year which was call'd *Annus Confuſionis*: Upon the Settling and Reſettling the *Julian Year*. (Of which *Kepler* gives an Acconnt with the Miſchiefs of it;) And the like in the Year 1582. when Pope *Gregory* did at Once ſtrike out 10 *Days* of that Year.

An. 1699. *by Dr.* J. Wallis. *Ib. p.* 348.

Tab. Rudolph.

Year. But if this Advice ſhould take Place, we ſhould now, inſtead of One *Annus Confuſionis*, have a Confuſion for 44 *Years* together: wherein we ſhould Agree neither with the *Old* nor with the *New Account*; but be ſometimes 10 *Days*, ſometimes 9 *Days*, ſometimes 8 *Days*, (and ſo forth) Later than the *One*, and ſooner than the *Other* Account. And a Foreigner would not be able to judge of an *Engliſh Date*, without knowing in which of theſe Years, we Vary 10, 9, or 8 *Days* (and ſo forth) from either of theſe *Accounts*. And this for 44 *Years* together. Which ſeems to me a much Greater *Confuſion*, than if (as in 1582) we ſhould *(once for all)* caſt out 11 *Days*. But I cannot think it Adviſeable to do *Either*.

The Julian Account *not to be Chang'd for the* Gregorian; *by Dr.* J. Wallis. *n.* 257. *p.* 343, 350

V. Concerning the *Alteration*, at this time Suggeſted, of the *Julian Account* for the *Gregorian*, I am at a loſs what to ſay. That there is in our *Eccleſiaſtical* Computation of the *Paſchal Tables* ſomewhat of Diſorder is not to be Deny'd, But I am very Doubtful, that if we go to *Alter* that, it will be attended with greater Miſchief, than the preſent Inconvenience. By removing *Ptolomy's Firſt Meridian* (though upon ſome Plauſible pretences) it is now come to paſs, that we have (in a manner) *No Firſt-Meridian* at all; but every New *Map-Maker* placeth his *Firſt Meridian* where he pleaſeth: which hath brought a great *Confuſion* in *Geography*. 'Tis Agreed by moſt (if not all) *Chronologers*, that as to the *Year of our Lord*, the *Annus Vulgaris* is not the *Annus Verus* (though it be not Agreed how much it differs:) But it would be a Horrible *Confuſion* in *Hiſtory*, if we ſhould now go about to Alter this *Vulgar Account*. And as to the Diſorder in the *Paſchal Tables*, it was a thing Noted and Complain'd of for 3 or 400 *Years*, before Pope *Gregory* did (unhappily) attempt the *Correction* of the *Calendar*. But it was, all that time, thought Adviſable, rather to ſuffer that Inconvenience, than, by *Correcting* it, to run the hazard of a Greater Miſchief.

The *Celebration* of *Eaſter* a *Week* or a *Month* Sooner or Later, doth not Influence at all our Solemn *Commemoration* of *Chriſt's Reſurrection*. But if it be thought neceſſary that the *Seat* of *Eaſter* ſhould be *Rectify'd* and the *Paſchal Tables* Corrected (and Pope *Gregory* made no other pretence) that may eaſily be done. For, if in the *Rule* for *Eaſter*, inſtead of ſaying *Next after, the* 21 *of March*, you ſay, *Next after the Vernal Equinox*, the work is done. And we might be excuſed the trouble of *Paſchal Tables*, and the Intricate Perplexities of the *Gregorian Epacts*. For then every *Almanack* will tell you when it is *Equinox*, and when it is *Full-Moon*, for the Preſent Year, (without diſturbing the *Civil Account*.) And this Pope *Gregory* might as well have done, without troubling the *Account* of *Chriſtendom*. But if he would needs Diſturb the *Civil Year*, ; he ſhould have *Rectify'd* it (not to the Time of the *Nicene Council*, but) to the Time of our *Saviour's Birth*. For our *Epocha* is not from the *Nicene Council*, but from the *Birth* of *Chriſt*. And moſt certain it is, that, at our *Saviour's Birth*, the *Vernal Equinox*, was not on the 21 of *March*, (as the *New Account* would ſuppoſe,) but nearer to the 25*th*.

However,

However, this Pretended *Reformation* of the *Calendar* Introduced that *Confuſion* of *Old* and *New Stile*, which we now complain of: and which now can never be Remedied, unleſs all Nations ſhould *at once* Agree upon *One*. I ſay *at once*; for if ſome Sooner, and ſome Later do *Alter* their *Stile*, the *Confuſion* (in *Hiſtory*) will yet be greater than now it is. 'Tis true, that upon Pretence of the Pope's (Uſurped) *Supremacy* in *Spirituals* (and in *Temporals* alſo in Order to *Spirituals*) moſt *Popiſh Countries* (but I think not All) have Submitted their *Civil Year* (as well as their *Eccleſiaſtical*) to the Single Authority of the *Pope's Bull*. But the *Church* of *England* had long before this Pretended *Correction* Renounc'd the *Pope's Supremacy*: and is therefore Unconcern'd in it. And I ſee no Reaſon why (after ſo long a Diſclaimer) we ſhould be *Now* fond to Re-admit it: for what greater Evidence (of Owning that *Authority*) can (in Practice) be Expected, than Obeying their Commands in things (otherwiſe) Unadviſeable? No doubt the *Hand of Joab* is in this Matter, though perhaps we do not ſee it. Beſides, This *Alteration* Cannot be made without altering the *Common-Prayer-Book*; (For, at leaſt, all the *Calendar* muſt be New framed:) And ſome are ſo Warm againſt Touching That in the Leaſt, that they are even againſt Conſidering whether Ought in it may be Chang'd for the Better. Had this been ſtarted in King *James*'s Time, with what Face would it have Look'd? And if the Mask be taken off, the Face is ſtill the ſame.

But 'tis not *England* Alone that uſeth the *Julian Year*; But all the 3 Kingdoms of *England*, *Scotland* and *Ireland*; and all our *Foreign Plantations*, which are not a few; and the two Kingdoms of *Denmark* and *Sweden*; the *Proteſtant Cantons* of *Switzerland*; and 4 of the 7 *United Provinces*; and many of the *Proteſtant States* in *Germany*. So that if *We* ſhould Change our *Style* in Compliance with ſome of our *Popiſh* Neighbours from whom we Differ, we ſhould then Vary from the Proteſtants with whom we now Agree; And particularly from *Scotland* with whom we are more concern'd to Agree than with *France*. A new *Law* in *England* would not compriſe *Scotland*: and we cannot promiſe our ſelves that they would Preſently Comply alſo. They are not ſo Pliable to the *Modes* of *Rome* as ſome in *England* are: as is Evident in their not Admitting *Epiſcopacy*; and the Buſineſs of *Eaſter* (which was the Sole Pretence for the Firſt *Alteration*) would to them, ſignify nothing, who (according to their Conſtitution) obſerve No *Eaſter* at all, but do rather declare againſt it.

If it be ſaid, that the other *States* may in time, be Induced to follow our Example: Perhaps ſome may (not at All:) but this would but make the *Confuſion* yet greater. For thenceforth, we muſt be obliged (if we would underſtand their *Dates*, and be at a Certainty in *Hſtory*) not only to Know what Countries do Uſe this or that *Stile*; but, from What Time they Began ſo to do. So that there will ſtill be as great Neceſſity of *S. V.* and *S. N.* (*Old Stile* and *New Stile*) as now there is: And with that *Diſtinction* we are now as eaſie as if we Change.

That

That the *Old Julian Year* is in it ſelf a better Form and more Adviſeable than the *New Gregorian* is ſo Notorious, that all *Aſtronomers* (even *Papiſts* themſelves) are fain firſt to Adjuſt their *Calculations* to the *Julian* Year, and thence Transfer them to the *Gregorian*. The *Equinox* going Backward (for 10 or 11 *Minutes* each Year,) is very Inconſiderable, and which in *Celeſtial* Computations, is eaſily Rectified; as are many other Inequalities of much Greater Concernment. And I think it was never pretended that the *Civil Year* muſt needs Agree (exactly to a *Minute*) with the *Celeſtial*; and if never ſo much Affected, is Impoſſible to be had. For the *Solar Tropical Year*, and the *Sidereal Year*, Differ more from each other, than the *Julian* from either; which is a Middle betwixt them.

It would therefore he much more Adviſeable (if the *Papiſts* would be as Compliant as they would have us to be) for the *Papiſts* to return to their *Old Julian Year*, than for us to Embrace their *New Gregorian*. And it might much Eaſier be Effected: For, if the *Pope* could be perſwaded to Grant a *Bull* to that purpoſe, All the *Papiſts* would, *at once*, be as much obliged ſo to do, as by *Pope Gregory's Bull* to vary from it. If it be ſaid, there is no Hopes of that; Then the Argument ſtands thus: If the *Pope* will not Leave his *Pretended Supremacy*, then we muſt *Admit* it. But this ſurely is no Inducement for Us to Exchange our Better *Julian Year* for one that is much Worſe.

The Concluſion of the Proteſtant States *in* Germany An. 1699. *for* Reforming *the* Calendar; *by* ..... *n.* 260. *p.* 459.

VI. The *Proteſtant States* of the *Empire* in the *Imperial Diet* of *Regenſburg*, having Deliberated upon the Projected *Reformation* of their *Almanacks*, have Reſolved on the following Particulars.

1. That after the 18*th.* of *February* 1700 *Old Stile*, the following 11 *Days*, ſhall be left out in the *Almanacks*, and the *Feaſt* of *St. Matthias* be kept on 18*th* of *February* aforeſaid.

2. The *Computation* of *Eaſter*, and the *Feaſts* thereon Depending, ſhall for the future be Calculated according to the True *Aſtronomical Calculation*; and this to continue only for this following *Century*, the *Aſtronomers* being left at Liberty, in the Mean Time to Conſult on further Methods, to prevent any Further *Variation*.

3. The *Mathematicians* ſhall be ordered to Conſider how for the future the Abuſe of *Judiciary Aſtrology* in the *Almanacks* may be Aboliſhed.

This *Reſolution* doth not Proceed from any Condeſcendence to the *Roman Catholicks*, nor can be Interpreted an accepting of the *Gregorian Calendar*, conſidering. 1. The *Omiſſion* or leaving out of theſe 11 *Days* Intercalated, is quite Different from that which they had done before; for here the *Calculation* of Time is only Reduced to the Courſe of the *Sun*, as it was before the *Nicene Council*. 2. Wherefore the Principal Thing in the *Gregorian Calendar*, and the *Gregorian Cyclus*, is yet Retained by them. 3. The *Aſtronomical* Computation of *Eaſter* in the *New Calendars*, is a Perpetual and Annual Real Proteſtation againſt the Injunction of Pope *Gregorius*; and yet 4*thly*, the Different Methods of Computation (the *Aſtronomical* which We Uſe, and the *Cyclus* which They Uſe) to find the *Eaſters* and *Feaſts* depend-

Depending thereon, makes no great Difference in the thing it ſelf, except in One only Caſe, otherwiſe they fall every Year on the ſame day. This Caſe is, that *Our Eaſter* will fall 8 Days Later than Theirs, when the *Æquinoctial Full-Moon* ſhall fall too near a *Sunday*. For then the *Gregorians*, according to their *Cyclus*, will obſerve their *Eaſter* on the *Sunday* immediately following: but the *Proteſtants*, to avoid obſerving *Eaſter* on the ſame Day with the *Jews*, which according to the *Aſtronomical Calculation* keep their *Eaſter*, 8 Days after; and that according to an Ancient *Rule*, and Practice of the *Chriſtian Church*, which, when *Eaſter Full-Moon* fell on a *Saturday*, and that *Saturday* happen'd to be the 21*ſt* of *March*, then the *Eaſter* is to be obſerved on the *Sunday* following, 8 *Days* after.

This *Reſolution* will not be an Occaſion of any further *Variance*, and Difference in the *Computation* of Time. For 1. The Numbring of the Days continues Uniformly without any Difference all the next *Century*; and before this *Century* be Ended, a Method will be Found, to Agree about the *Secular Intercalary Day*. 2. The *Gregorians Calendar* does not Depart much, nor will hereafter, from the *Courſe* of the *Heavens* and the *Canons*; and except in the aforeſaid Caſe, the *Computations* of *Eaſter* will every Year actually agree. 3. It is not now neceſſary to trouble our Selves with the Feared Notable Removing of *Eaſter* from its due *Term*, which the *Gregorian Calendar* will occaſion: for before that happens, if the World ſhall ſtand yet many Ages, Means will be found to Prevent it.

If any *Correction* of the *Gregorian Calendar* ſhould Happen (which is hardly to be Preſumed) yet our *Aſtronomical Calculation* will always be more Accurate than their *Cyclus*, and if they will not Tranſgreſs againſt the *Canons*, and the Courſe of the *Heavens*, they muſt comply with us. It being thought fit that 11 *Days* ſhould *at once* be Left out, it was alſo thought beſt to do it immediately before the 1*ſt*. of *Mar. St. No.* and that in the *Year* 1700, inſtead of Writing and Numbering after the 18*th*, the 19*th* of *Feb.* to Write the 1*ſt*. of *March*; and that becauſe 1. in theſe 11 *Days* is no *Feaſt-Day*, and St. *Matthias* falls on a *Sunday*, ſo that it's all one whether it be Obſerved on the one or the other *Sunday*, 8 *Days* ſooner or later. 2. Becauſe thus the *Old* and *New Stile* will be fully *United* and Reconciled, and that *at once*.

VII. The *Garter* ſhews the *Number* of *Days*, (30, 29, 30, 29, *&c.*) which each of the 12 *Months* of the Year is to Contain: And in the *Buckle* is diſcovered through a *Hole*, the Days of a 13*th Month* (31, 30, 31, 30 *&c.*) to be Added to the Years, 2, 5, 7, 10, 13, 15, 18, 21, 24, 26, 29, 32, 34, 37; in all to 14 of 38, as in a *Cycle* behind; which being ſuppoſed Moveable one 38*th* part every Year backwards or contrary to the Months in the *Garter*, its Revolution is Compleated in 38 Years: And the 38*th* Year Current, or the Year of the *Period* or *Cycle*, is ſhewed through another Hole.

A New Luni-Solar Year, and a Perpetual Almanack; by Mr. R. Wood. Ph. Col. n. 2. p. 26.

Fig. 2, 3.

Once every *Century*, or to one Year in 100, add *One* Day. *viz. To the Firſt* 50th Year, *or middle of the* Century, *or rather to the Firſt* 70th Year, *(becauſe*

(*because the First* New-Moon, March 10. 1680 *happens a little after* Midnight, *and after the* Vernal Equinox) *and then to every* 100th. Year *following*; *which* Additional Day *being* Omitted *every* 230th *or* 240th Century (*or near thereabouts if any one shall require such great Exactness*) *will Ballance the* Account *for ever.*

The *New year*, and *Account*, may best Begin with the *Vernal Equinox*; or rather with the Day of the *New-Moon* happening near Midnight about that Time, as *March* 10. 1680.

The *Egyptian Hieroglyphick* of the *Year* was a *Serpent* Carved into a Circle or Ring, with Tail in Mouth: but the *Emblematical Garter* will be much more proper for *England*; and is so exactly fitted to the *Moon's Motion*, that One Day will not be Lost or Got in *Millions* of *Years*.

(*a*) Almon-ac. *Our* Ancestors *used to Carve the* Courses *of the* Moon *of the whole* Year *upon a* Squared Stick, *which they call'd an* Al-mon-aght, *that* is, Al-moon-heed. Verstegan. p. 58. *The* Dutch *Al-maen-acht imports the same.*

This (*a*) *Almon-ac* Measures Time principally by the *Moon*; but with a Great and near Respect to the *Annual Motion* of the *Sun* on Earth. The Unite or least Measure is a *Day*; and the *Garter* or *Luni-solar Year* will be, at a Medium, within about a Week, or Half a Hundredth-part, of the True *Solar Year*; that is, so near that the Difference will not be Discerned by Ordinary Popular Observation, (and therefore must needs answer the Ends of *Husbandry*, and other *Civil Affairs*, well enough) and come often Near, and sometimes very Near; and at certain *Periods* they Ballance one another; and have a kind of Co-incidence or Agreement, much better than the *Sun's Course* has with the *Italian Account*, so much Magnify'd by *Scaliger* and *others*.

I find the Elder World generally *Computed* their Time (and most of the *Eastern* Countries, if not the Bulk of Mankind, do so still) by the *Moon*, or by the *Lunar*, or *Luni-Solar Year*; made up of *Moons*, or Real *Months*, or somewhat near the Matter such; which *Months* were for the most part 12, and some Years 13. This appears from their *Kalendars*, &c. 'Tis plain (from 1 *Sam. c.* 20. *v.* 5, 18, 24. compared with *v.* 27, 34.) that the Days of the *Jewish Month* were the same with those of the *Moon*: And the *Græcians* (where *Astronomy*, as well as other Arts and good Learning most Flourish'd) and particularly the *Athenians*, (according to the Institution of their Wise Legislator *Solon*) did thus Reckon their Time; and so did the *Romans* too, till *Julius Cæsar* Alter'd, I cannot say Mended, the Year,

Among the *Græcians* there Lived, in three not far distant Ages, three Famous *Astronomers* in their several Times, *Meton*, *Calippus*, and *Hipparchus*; each of whom still farther improved *Astronomy*, and Rectify'd the *Accounts* of *Time* more and more one after another respectively, according to their Light, and the Observations of their Own and the fore-going Ages. *Hipparchus*, the Last of them Flourished about 100 or 90 *Years* before *Julius Cæsar* Altered the Year: Yet *Cæsar*, or his *Astronomer Sosigines*, follow'd *Calippus* in Framing the *Julian Year*; as I find by Examining their *Accounts*. For *Calippus* his *Period* of 76 *Years* consisted of 27759 *Days*, and so do 76 *Julian Years*. About 3 *Centuries* and a Half after *Cæsar*, the *Council* of *Nice* (first) and about 2 *Centuries* after that *Dyonysius Exiguus* (again) introduc'd the *Decennoval Cycle* (call'd the *Golden Number*) for the *Celebration* of *Easter*; following

following *Meton*, the *firſt* and *leaſt Exact* of the *Three*; or rather following both *Meton* and *Cæſar*, two Maſters, who were neither of them the Beſt, and would after ſometime Diſagree and Part further from each other; though both *Cæſar* and the *Church* might have had a much better Copy from *Hipparchus*: Which Miſtakes of theirs (and their Eyes being Dazled with the *Sun*, whereas they might more ſafely have looked on the *Moon*) have occaſion'd thoſe *Anticipations* and Differences, that have Embarraſs'd the *Accounts* of *Time*, and theſe Parts of the World in the Succeeding Ages. And though many have propoſed Laudable Ways of Redreſſing the ſaid *Accounts*, yet ſtill building upon the Old Foundations which were Infirm: Pope *Gregory* XIII. in his *Reformation* of the *Calendar*, about 100 Years ſince, was neceſſitated to wave the *Golden Number*, and yet He has but Palliated the Diſeaſe; ſo hard it is to Cure an Error in the firſt Concoction.

The *Council* of *Nice* appointed *Eaſter* to be kept the *Firſt Sunday after the Firſt Full-Moon after the* 21 *of March*, becauſe the *Vernal Equinox*, which was on the 25*th* in our *Saviour's Time*, was then come to be on the ſaid 21 *Day*, and Therefore the *Gregorian Reformation* has Reduced the *Vernal Equinox* back to that Day. But in this *Garter Year*, *Eaſter* will always be the *Firſt Sunday after the Firſt Full-Moon of the New Year*; that is after the *Vernal Equinox*, according to the true Intent and Meaning of the *Nicene Council*; or as it was in the *Primitive* Times: and be but a Week *Moveable*, or a Month *leſs Moveable* than now, either after the *Old* or *New Stile*: Which might perhaps have Prevented the Difference, or Served as an *Expedient* for reconciling the *Weſt* and *Eaſt Churches*.

The three *Cycles* of *Meton*, *Callippus* and *Hipparchus*, were all of them too large for the *Sun*, and Primarily Intended for the *Moon*, or for a *Luniſolar Year*; however that of *Hipparchus* was Neareſt to both, and very near the *Moon's Period*.

Perhaps at firſt View, my 38 *Years Period* may be looked upon but as a *Double Metonic*, or *Semi-Calippic* one, *&c.* But upon farther Conſideration, it will be found otherwiſe: for *Meton* and *Calippus*, their *Periods*, as alſo that of *Hipparchus*, were all of them too Big, not only for the *Circuit* of the *Sun*, as I ſaid before, but for that of the *Moon* alſo; whereas *Mine*, on the other hand, is too little for either, and Needs one *Additional* Day in near about every 100 Years.

Meton's 19 Year *Cycle*, or *Enneadecaeteris*, had 6940 *Days*, the *Double* whereof is	13880
Calippus his *Period*, or 76 *Years*, had 27759 *Days*, the *Half* whereof is	$13879\frac{1}{2}$
Hipparchus his *Period*, of 304 Years, had 111035 *Days*, the 8*th* part whereof is	$13879\frac{3}{8}$
Whereas *My* 38 *Years Period* hath but juſt *Days*	13879

So that it may eaſily Appear, to any one who ſhall pleaſe to Examine it, wherein my *Cycle* or *Period* Differs from all Theirs: But the Frame of my

Contrivance of this ſo Nice Matter, for the eaſie Explication thereof, even to the Groſſeſt Capacities, as to Practice and Uſe is Wholly Different from Theirs, and every one's elſe I ever yet heard of.

I choſe rather to take the *Revolution* of the *Moon*, than that of the *Sun*, for my Chief and Primary Meaſure of *Time*; Becauſe, *Firſt*, the *Lunar Phaſes*, and conſequently *Months*, are more eaſily Diſcerned, than the *Sun's Annual Period*, even by the moſt Ignorant Vulgar Eyes; who need but look up, almoſt any Night, to ſee their *Almonac*. *Next*, The Obſervations upon the *Moon*, made by the more Knowing Men, have been more in Number, more Exact, and of far greater Antiquity; *Aſtronomers* having had the Help of *Eclipſes* of very Diſtant Ages, for their Guide, in Finding out very near the True Meaſure of the *Moon's Mean Motion*. *Laſtly*, Keeping an *Account* by the *Moon*, we may reckon by the *Sun* alſo, that is to ſay, by *Months* and *Years* too; whereas on the contrary, reckoning by a *Solar Year* the *Months* are but Empty Names, and in *Meaſuring* of *Times* and *Seaſons* the *Moon* is Rendered of no Uſe; though ſome *Inanimate* Bodies (ſo Conſiderable, that they take up and poſſeſs perhaps Half this our Globe) as the *Seas*, do exactly obſerve the *Moon's Courſe*; and there are *Living* Creatures alſo thought perhaps no leſs Conſiderable, at Land, that do the like; which I need not mention, nor take any farther Notice of the near Affinity, if not Conſanguinity with the Garter.

The Time and Place of Cæſar's Deſcent upon Britain; by Mr. Edm. Halley. n. 193. p. 495.

VIII. The Authors that Mention *Cæſar's Expedition* into *Britain* with any Circumſtances, are *Cæſar* himſelf and *Dion Caſſius*. It is certain that this Expedition of *Cæſar's*, was in the Year of the *Conſulate* of *Pompey* and *Craſſus*, which was in the *Year of Rome* 699. or the 55*th* before the uſual *Æra* of *Chriſt*: and as to the *Time* of the *Year*, *Cæſar* ſays that, *Exigua parte Æſtatis reliquâ*, he Came over only with Two *Legions*, *viz.* the 7*th* and 10*th*. and all *Foot*, in about 80 Sail of Merchant Ships, 18 Sail that were Ordered to carry over the *Horſe*, not being able to get out at the ſame time from another Port, where they lay *Wind-bound*. He ſays, that he Arrived about the 4*th Hour* of the *Day*, *viz.* between 9 and 10 in the Morning, on the Coaſt of *Britain*: where he found the Enemy Drawn up on the Cliffs ready to Repell him; which place he thus Deſcribes, *Loci hæc erat natura, adeo Montibus Anguſtis Mare continebatur ut ex locis Superioribus in Littus Telum adjici poſſit*, by which the Cliffs of *Dover* and the *South-Foreland*, are juſtly Deſcribed; and could be no other Land, being he ſays in the 5*th Book* of his *Commentaries*, *in* Britanniam *Trajectum eſſe cognoverat circiter* Millium Paſſuum Triginta *à Continenti*. Here he ſays he came to an Anchor, and ſtaid till the 9*th Hour*, or till about between 3 and 4 in the Afternoon, expecting till the Whole Fleet was come up; and in the mean time call'd a *Council* of *War*, and Advertiſed his Officers, after what manner they were to make their *Deſcent*, particularly in Relation to the *Suff* of the *Sea*, whoſe Motion he calls *Celerem atque Inſtabilem*, Quick and Uneven. Then *viz.* about 3 in the Afternoon, he Weighed Anchor, and having gotten the Wind and Tide with him, he Sailed about 8 *Miles* from the

the *First Place*, and Anchored againſt an Open and Plain Shore. Here he made his *Deſcent*, and having told us the Oppoſition that was made, and the Means he uſed to get on Shore, he comes to ſay after that he had been 4 *Days in Britain*, the 18 Ships with his *Horſe* put to Sea, and were come within Sight of his *Camp*, when a ſudden Tempeſt aroſe, with Contrary Wind, ſo that ſome of the Ships put back again, others were Driven to the *Weſtwards*, not without great Danger, and coming to an Anchor, they found they could not *Ride* it out: ſo when Night came on, they Put off to Sea and returned from whence they came. That ſame Night it was *Full-Moon*, which makes the *Greateſt Tides* in the *Ocean*, and they being Ignorant thereof, their *Gallies* which were Drawn on Shore, were fill'd by the *Tide*, *&c.* Then he ſays, that the *Day* of the *Autumnal Equinox* being at hand, after ſome days ſtay, wherein there paſſed no Action becauſe he kept cloſe in his Camp by the Shore; and not thinking it Proper to Stay till the *Winter* came on, he Returned into *Gallia*. The next Year he made a further *Expedition* with 5 *Legions* and a good Body of *Horſe*: but there is little in the Hiſtory thereof ſerving to our Purpoſe, excepting that he ſays, he ſet Sail from the *Portus Icius* about *Sun ſet* with a Gentle S. W. Wind, *Leni Africo profectus*; that about *Midnight* it fell Calm, and being carried away with the *Tide*, by the time it was Day, he found he had left *Britain* on the *Left Hand*; but then the *Tide* Turning, they fell to their Oars, and by *Noon* reached that part of the Iſland where he *Landed before*, and came on Shore without Oppoſition: and then Marched up into the Country, leaving his Ships at Anchor *in Littore Molli & Aperto.*

Dion Caſſius, ſpeaking of the Landing of *Cæſar* ſays, ὁ μέντοι καὶ ἧ ἐδόκει προσέσχεν; that is, as I Tranſlate it, But he *Landed* not where he Intended, for that the *Britains*, Hearing of his Coming, had poſſeſt all uſual places of *Landing*, Ἄκραν οὖν τινὰ προέχουσαν παρεπλεύσας ἐτέρωσε παρεκομίσθη. Κἀνταῦθα τοὺς προσμίξαντας οἱ ἐς τὰ τενάγη ἀποβαίνοντι νικήσας, ἔσθη τ' γῆς κρατήσας; in my *Engliſh*, Wherefore doubling a certain Head Land, he made to the Shore on the other ſide, where he overcame thoſe that Skirmiſhed with him at the *Water's Edge*, and ſo got well on Land.

From theſe *Data*, that it was in the Year of the *Conſulate* of *Pompey*, and *Craſſus*; that it was *Exiguâ parte Æſtatis reliquâ*, and 4 *Days* before a *Full-Moon*, which fell out in the *Night-Time*; the Time of this Invaſion will be Determined to a *Day*: For by the *Eclipſe* of the *Moon*, whereof *Druſus* made ſo good uſe to Quiet the Mutiny in the *Pannonian* Army, upon the News of the Death of *Auguſtus*, it follows that *Auguſtus* Died *An. Chr.* 14. which was Reckoned *Anno Urbis Conditæ* 767; and that this Action was 68 *Years* before, *viz.* in the 55*th Year before Chriſt* Current. In which Year the *Full-Moon* fell out *Aug.* 30. after Midnight, or 31 in the Morning before Day. The Preceeding *Full-Moon*, was *Aug.* 1. ſoon after Noon, ſo that This could not be the *Full-Moon* mention'd, as falling in the Day time: nor that in the beginning of *July*, it being not 10 Days after the *Summer-Solſtice*, when it would not have been ſaid *Exiguâ parte Æſtatis reliquâ.* It follows therefore that the *Full-Moon* ſpoken of, was on

Auguſt

Auguſt the 30 at Night, and that the *Landing* on *Britain* was *Aug.* 26. in the Afternoon, about a Month before the *Autumnal Equinox*; which Agrees to all the Circumſtances of the Story in point of *Time*.

As to the *Place*; the *High-Land* and *Cliffs* deſcrib'd being allowed by all to be thoſe of *Dover*, it only remains to Examine whether the Deſcent was made to the Northward or Southward of the Place where he Firſt Anchored. The *Data* to Determine this, are 1*ſt*, that it was 4 *Days* before the *Full-Moon*. 2. That that Day by 3 *of the Clock* in the Afternoon, the *Tide* ran the ſame way he Sailed. 3. That a *S.* by *E. Moon* makes *High-Water* on all that Coaſt the *Flood* coming from the *Southward*: hence it will follow that that *Day* it was *High-Water* there about 8 *in the Morning*, and conſequently *Low-Water* about 2, wherefore by 3, the *Tide* of *Flood* was well Made up; and it is plain that *Cæſar* went with it, and the *Flood* ſetting to the Northward ſhews that the *Open Plain Shore* where he *Landed* was to the Northward of the *Cliffs*, and muſt be in the *Downs*. A 2d Argument is drawn from the *Wind* wherewith he Set out on his Second Expedition, *viz.* S. W. as appears by the Words *Leni Africo profectus*, with which the Navigation of theſe Times would hardly permit a Ship to Sail *nearer the Wind* than 8 Points, or a N. W. Courſe; which would ſerve indeed to go into the *Downs*, but would by no means Fetch the Lowland towards *Dengyneſs*, which is much about Weſt from *Calais*, and not more than W. N. W. from *Boulogne*, if it ſhall be ſaid that that was the *Portus Icius* from which *Cæſar* ſet out. Whence I take it to be Evident, that if *Cæſar* was not bound more Northerly than the *South Fore-land*, he could not have thought the *Africus* or *S. W. Wind* proper for his Paſſage, which was then intended for the Place where he Firſt Landed the *Year before*.

Juſtly to determine which the *Portus Icius* was I find no where ſufficient grounds; only *Ptolemy* calls the *Promontory* of *Calais-Cliffs* by the Name of Ἰκιον ἄκρον, whence there is reaſon to conjecture, that the *Portus Icius* was very near thereto, and that it was either *Ambleteuſe* on one ſide, or *Calais* on the other. The ſame *Ptolemy* places Γισοῤῥιακον ὄρμεον in the ſame Latitude with the Ἰκιον ἄκρον, but ſomething more to the Eaſt: which ſeems to Refute thoſe, that have ſuppoſed the ancient Port of *Geſſoriacum* to have been *Boulogne*, whereas by *Ptolemy*'s Poſition, it muſt be either *Dunkirk* or *Gravelingue*, but the former moſt likely, both by the diſtance from the Ἰκιον ἄκρον being about 20 Miles or half a Degree of *Longitude* to the Eaſt, or $\frac{2}{5}$ of the whole Coaſt of *Flanders*, which he makes but a Degree and quarter from the *Acron Icion* to the Mouth of the *Scheld* which he calls *Oſtia Tabudæ*; as alſo for that *Pliny l.* 4. *c.* 16. ſpeaking of *Geſſoriacum*, ſays the *Proximus Trajectus* into *Britain* from hence is 50 Miles, which is too much unleſs *Geſſoriacum* were ſomething more Eaſterly than *Calis*. *Dion Caſſius* makes the Diſtance betwen *France* and *Britain* 450 *Stadia*, or 56 Miles, and ſays likewiſe 'tis the neareſt, τὸ ξωλομώταλον. But this is in part amended by the Explication given in the *Itinerary* of *Antoninus*, where the ſpace between *Geſſoriacum* and *Rutupium* is ſaid to be 450 *Stadia*.

Stadia, (for this was the ordinary paſſage of the *Romans* into *Britain*,) *Rutupium* being more Northerly and *Geſſoriacum* more Eaſterly than the *Termini* of *Cæſar*'s Voyage, and conſequently the Diſtance greater than 30 Miles, which *Cæſar* had obſerved : and now lately an Accurate Survey has proved the Diſtance between Land and Land to be 26 *Engliſh Miles*, or 28½ *Roman Miles*, which ſhews how near *Cæſar*'s Eſtimate was to the Truth.

A farther Argument (but not of equal Force with the former, becauſe of the modernneſs of the Author, who writ above 250 Years after) may be drawn from the Words of *Dion Caſſius*, where he ſays, ἄνεμον τινὰ περίχεσαν πλεύσας ἐτέρωσε παρεκομίσθη, that after his Firſt Anchoring he Sailed about a Promontory to the place where he Landed : Now there are no other Promontories on all that Coaſt but the *South-Fore-Land* and *Dengyneſs*; the latter of which it could not be, becauſe *Cæſar* ſays he Sailed but 8 Miles, and the *Neſs* it ſelf is about 10 Miles from the South and neareſt End of the Chalk-Cliffs by the Town of *Huth*; and to have gone round that Point to the other ſide, the Diſtance muſt have been much greater. So that the Promontory ſpoken of by *Dion*, muſt needs be the *South-Fore-Land*, and *Cæſar* muſt needs Anchor near over againſt *Dover*; from whence Sailing 8 Miles, he would double a Head-Land and come to the *Downs* ; which is ſuch a Coaſt as he Deſcribes, in one place by *Apertum ac Planum Littus*, and in his 5*th Book* by *Molle ac Apertum Littus*.

As to *Dion's* Words εἰς τὰ τενάγη, which I have Tranſlated *at the Waters edge*, I have the Authority of *Suidas* for doing it, who ſays τέναγος, πελαγία ἰλὺς or *the Sea-mud*, and is therefore properly the *Ouſe* on the *Sea-ſhore*. And the *Etymologiſts* Derive it from τέγγω *madefacio*, becauſe the Waſh and breach of the Sea does always keep it *Wet*. And this Word τὰ τενάγη is uſed by *Polybius* for the *Sea-Ouſe*; and in another place he ſpeaks of the Difficulty of Landing at the Mouth of a River διὰ τὴν τεναγώδη πάροδον, *ob Limoſum Acceſſum*; ſo that it is not to be doubted that it ought to be rendred in this place, *ad Vadum Maris* rather than in *Paludibus*. And ſo this Objection againſt the Aſſertion that *Cæſar* Landed in the *Downs*, which is known to be a Firm Champain Country without Fens and Moraſſes, will be remov'd ; and the whole Argument will 'tis hop'd be Admitted by the Curious. P. 498.

IX. Here are found at *York* in the Road, or *Roman-Street* without *Midſel-gate*, and likewiſe by the River-ſide, where the Brick Kilns now are, *Urns* of 3 different Tempers. *Viz.* 1. *Urns* of a *Blewiſh Gray* Colour, having a great Quantity of Courſe Sand wrought in with the Clay. 2. Others of the ſame Colour, having either a very Fine Sand mixt with it full of *Mica*, or *Catſilver*, or made of Clay Naturally Sandy. 3. *Red Urns* of Fine Clay, with little or no Sand in it. Theſe Pots are quite throughout of a *Red* Colour like fine *Bole*. Alſo many of thoſe *Red* Pots are elegantly adorn'd with Figures in *Baſſo Relievo*, and uſually the *Workman's Name*, which I think others have miſtaken for the *Perſon's Name Bury'd* there, upon the Bottom or Cover ; as *Janarius* and ſuch like ; but that very Name I have

Roman Urns *and other* Antiquities *near* York ; *by Dr.* M. Liſter. *Ph. Col.* n. 4. p. 87.

Burton's *C. Ant It. p.* 183, 230.

have ſeen upon ſeveral *Red Pots*, found both here and at *Aldborough*. After all, theſe are Glaz'd inſide and outſide with a kind of Varniſh of a bright *Coral* Colour.

The Compoſition of the *Firſt* ſort of Pots, did firſt give me Occaſion to diſcover the *Places* where they were Made: the one about the midway betwixt *Wilberfoſſe* and *Barnbie on the More*, 6 Miles from *York*, in the Sand Hills, or Riſing Ground, where now the Warren is. The other *Roman Pottery* on the Sand-Hills at *Santon*, not far off *Brigg* in *Lincolnſhire*. In the Firſt place I have found widely up and down broken pieces of *Urns*, *Slagg* and *Cinders*: At the latter place there are yet remaining (though it is a Moveable Sand, and Hurry'd every way by the Wind, and has by that means covered the place all over) ſome of the very *Furnaces*, whoſe Ruines I take to be ſome of thoſe *Metæ* or Sandy Hillocks. Beſides here are many *Pieces* of *Pots* and *Urns* of different Shapes, and much *Slagg* and *Cinders*; This *Potterie* having taken up much Ground, as to one that ſhall diligently view the place, it will appear. 'Tis remarkable, that both the abovementioned *Potteries* are within leſs than a Mile of the *Roman Road*, or *Military-High-Way*. I could not Learn at either of thoſe places where any Clay for that purpoſe was to be had near thoſe Sands, which yet our *Modern Potteries* chiefly ſeek after, which has made them to be Forgotten and Diſuſed.

The *Roman Urns* above deſcribed Differ in theſe Particulars, from what Pots are now uſually made amongſt us. 1. That they are without all manner of *Glazing* with *Lead*, which perhaps is a Modern Invention. 2. That a far greater Quantity of Sand is uſed than Clay, which thing alone made it worth their while, to bring their Clay to the Sand-Hills. 3. That they were Baked either with more Leiſure after long and through Drying, or Incloſed within certain Coffins to defend them from the Immoderate Contact of the Flames: which I am induced to believe, becauſe there ſeem to be Fragments of ſuch things to be found. 'Tis certain the Natural Colour of the Clay is not Altered by Burning: So that both the Degrees of Heat and manner of Burning might be Different. And one of theſe Potſherds, as I have heard, Baked over again in our *Ovens*, will become *Red*. As to the Two laſt kind of *Urns*, it is likely the *Firſt* of them, with their Particles of *Mica* in it, were made of a Sandy Blue Clay, of which Nature there is plenty among the Weſtern Mountains of *Yorkſhire*, and particularly at *Carleton*, not far off *Ickley* a *Roman Station*. The *Red Urns* ſeem to have been their Maſter-piece, wherein they ſhewed the Greateſt Art, and ſeem'd to Glory moſt, and to Eternize their Names on them. I have ſeen great Varieties of Emboſſed Work on them. And laſtly for the Elegant manner of *Glazing*, it was far Neater indeed, and more Durable than our Modern Way of *Leading*, which is apt to Crack and Craſe, both with Wet and Heat: and at the Fire is certainly unwholſome, by reaſon of the Fumes *Lead* uſually Emits, being a quick Vaporable Metal. This ancient *Glazing* ſeems to have been done by the Bruſh, or Dipping; for both Inſide as well as Outſide of the *Urn* are *Glaz'd*, and that before the Baking. And ſomething of the Materials of it ſeems to be remembred by *Pliny*, *Fictilia*

Lib. 36. c. 19.

lia ex Bitumine Inſcripta non delentur; The Painting of Pots with Bitumen is Indelible. And again, *Tingi ſolidas ex Bitumine Statuas; The Bitumen,* he ſays, *Sinks into the very Stones and Pots,* which is ſomething more than *Glazing.* Lib. 35. c. 15.

The great Plenty of theſe *Urns* found in many Parts of *England*, ſeems to Argue them alſo of *Engliſh* Manufacture, but where I cannot gueſs, unleſs wrought at the *Bole-Mines*, of which Clay alone they ſeem to be made, in *Cleveland*, for that the Barren Tract of Land call'd *Black-Moor* was well known to the *Romans*, the *Jet* Rings taken up with theſe *Urns* do ſufficiently teſtify. Now *Jet* and *Bole* are no where that I know of to be found with us in *England* but in that Tract; being Foſſils peculiar to thoſe Mountains. Of theſe *Jet* Rings ſome are Plain, and others Wrought, but all of them of an extraordinary Bigneſs, being at leaſt 3 Inches Diameter, yet the inward bore is not above an Inch and an Half, which makes them too little for the Wriſts of any Man, as they are much to big for the Fingers. So that probably they were never worn either as *Armillæ* or *Anuli.*

The Obelisks *at* Burrow-Briggs *not Artificial but Natural Stones. ib. p.* 90.

Being upon this Subject of *Roman Clay-work* we cannot but take notice of the Opinion of *Cambden*, who will have the *Obelisks* at *Burrow-Briggs*, in this County, *Artificial*, when in truth they are nothing leſs, being made of one of the moſt common ſorts of Stone, *viz.* of a Courſe Rag, or Milſtone-grit; but without doubt, the Bigneſs of the Stone Surprized him, either not thinking them Portable, or perhaps not any *Engliſh* Rock fit to yield Natural Stones of that Magnitude. But *Roman Monuments*, I ſuppoſe, none does doubt them, becauſe pitch'd here by a very remarkable and known *Roman Station, Iſurium.* And then conſider what Trifles theſe are, compared with the leaſt *Obelisks* at *Rome.* And as to the Rocks whence they might be hewen, there are many of that Stone near the River *Nid*, and upon the Foreſt of *Knarsbourg*; and a little above *Ickly*, (another *Roman Station*) within 16 Miles of *Burrow-Briggs* there is One Solid Bed of this very Stone, whoſe Perpendicular Depth only will yield *Obelisks*, at leaſt 30 Foot long. And yet at *Rudſtone* near *Burlington* in the *Yorkſhire Woolds*, full 40 Miles wide of theſe Quarries, is an *Obelisk* of the very ſame Stone, Shape, and Magnitude, of theſe before mention'd.

Other Roman Antiquities. *ib.*

But we cannot let this paſs without Noting, That almoſt all the *Monuments* of the *Romans* with us, were of this ſort of Stone; As the Ancient Walls of this City, as appears by what remains of the Ancient Gates, and the great Quantities of it that is Wrought up in moſt of the Churches, and is ſtill Daily dug out of Foundations: but a moſt undeniable Inſtance is, a vaſt *Roman Head*, perhaps of ſome of the *Emperors*, upon a Neck or Square Pedeſtal of one Solid Stone, with the Point of the Square to the Eye, of as Courſe a Grit as that of the *Obelisks* above-mention'd. This Stone is now in Mr. *Hilliar*'s Garden, and was Dug out of the Foundations of ſome Houſes thereabouts. The only remaining *Inſcription* that I could find at *Burrow-Briggs*, yet Imperfect as well as Odd, is upon this ſort of Stone in the Street-Wall of Sir *William Tanker*'s Houſe. Alſo two *Roman Altars* I have ſeen of this Stone; One the Original of that at *Ickly* mention'd in *Cambden*; Fig. 4.

Cambden; another in the Poſſeſſion of that Learn'd Antiquary Mr. *Thirsby*, late of *Leeds*. And this I think ſufficient to diſprove that Miſtake of *Cambden*, That the Stones of *Burrow-Briggs* are *Artificial*. There is but one only Inſtance that I ever yet met with of the *Romans* ever having uſed in theſe Parts of *England* any other ſort of Stone; yet it is not the Common Limeſtone, but a certain ſort of Stone had from the Quarries about *Malton*, becauſe of the *Lapides Judaici*, by me formerly deſcrib'd, to be ſeen in the Texture of it. It is a ſmall but Elegant Altar with Figures, in *Baſſo Relievo*, of Sacrificing Inſtruments, *&c.* It has ſuffer'd an unlucky Accident by the Stupid Ignorance of the Maſons, who were Order'd by the late Lord *Fairfax* to place it upon a Pedeſtal in the Court of his Houſe at *York*; yet the Inſcription was by chance Preſerv'd.

Vid. Vol. II. *Cap.* III.

Fig. 5.

I have alſo met with a large Pedeſtal of the ſame Courſe *Ragg*, found deep in the Ground, on the Weſt ſide of the River, which by the Stone and its Mouldings, was undoubtedly *Roman*, and muſt have been for a Pillar in ſome Large Building.

n. 145. *p.* 73.

There is a broken *Inſcription* in the Church Wall in *All-Saints North-Street*, with the Figure of a Naked Woman in *Baſſo Relievo* on the Left ſide of it. The Letters (as many of them as remain) are exceeding fairly Cut, beyond any thing I have yet ſeen of *Roman Antiquities* in *England*, and the Stone is of a Finer Grain than Ordinary. It is a Monument of *Conjugal Affection*. The Firſt Stroke is the out-ſide of a great M, and is part of the *Dis Manibus*. The 3 laſt Lines may be Read thus, *Benè merenti Antonio Conjugi*: yet it is hard to ſay, whether it was for the *Husband* or *Wife*, for it may be Read *Antoniæ*. The Points alſo betwixt the Words are here very Singular, but this was the Caprice of the *Stone-Cutter*, who ſometimes alſo uſes a Leaf, Hanging or Erect, a Hand, a Feather, or ſuch odd Fancy for *Points*.

Fig. 6.

A Roman Pottery near Leedes; by Mr. Ralph Thoresby. n. 222, *p.* 319.

X. I have lately diſcover'd a *Roman Pottery* upon *Blackmore*, about 2 Miles from *Leeds*, (the Old *Leogeolium*). The Name *Hawcaſter Rigg* gave me the firſt Occaſion to hope for ſome *Roman Ruines* there; but inſtead of the Remains of a *Regular Camp* or *Fortification*, I was ſurpriz'd to find ſeveral Rounds, or Circular Heaps of *Rubbiſh*, abundantly too Small for any *Military* Uſe; One by the Wheel, was 16 *Perches* Round; another in Walking, 76 *Paces*: and theſe I take to be the Ruines of ſome of the very *Furnaces*; 'tis a *Sandy* Ground, yet Plenty of *Clay* at no great Diſtance. The Country-People tell me of Heaps of *Slagg* and *Cinders*, but I had not the hap to meet with any, the place being grown over with Moſs, *&c.* I am ready to fancy theſe might be for their *Bricks*, becauſe of the great Plenty of *Clay* in the Neighbourhood, and the great Number of thoſe *Roman Bricks*, yet to be ſeen in the Ruines of *Kirkſtal-Abbey*: and that it belonged to the *Romans*, I conclude, becauſe it is Seated upon a Branch of the *Roman Way*, or one of their *Viæ Vicinnales*, that Leads from the Great *Military Road* upon *Bramham-Moor*, by *Thorner*, *Shadwell*, and *Kirkſtall* to *Cambodunum*. Beſides, the very Name ſeems to import ſome *Roman*

Caſtrum

Caſtrum near the adjoyning Eminency that the *Saxons* call'd *Haws* or *Houghs*; and the Word is yet retain'd in ſome parts of *Yorkſhire*, witneſs *Hamleton-Hough* in the Road to *Selby*: And to conclude, the Village that ſucceeded the *Old Pottery* is call'd *Potter Newton*.

The Excellency of Roman Bricks *and* Plaiſtering; *by* ..... *n.* 93. *p.* 6010.

XI. *Vitruvius* tells us, that the *Romans* anciently let their *Bricks* ſtand to Dry a whole Year, ſometimes longer, before they were *Burnt*: and 'tis obſervable that thoſe ſtupendious *Remains* of that Ancient *Amphitheatre* of *Roman*-work being all Bricks, near *Bourdeaux*, are ſtill as Firm as a Rock, excepting ſuch places as the Rains and Storms have ſpoil'd, by getting in at top: Which may alſo be ſeen in divers other old Structures in *Italy*, *France* and elſewhere.

Their *Plaiſtering* alſo to this Day, where it hath not met with Violent Knocking or Breaking, is to be ſeen as free from Cracks or Crevices, and as Smooth and Poliſht, as if it were Marble: witneſs their *Aqueducts*, whoſe bottom and ſides were thus *Plaiſtered*; and particularly that, whereof ſome Yards are ſtill to be found on the top of *Pont de Gare* near *Niſmes*, for the ſupport of which that Famous *Bridge* was built to carry Water to the ſaid Town.

An Old Earthen Veſſel *found near* York; *by* ..... *n.* 171. *p.* 1017.

XII. An Old Earthen Veſſel was lately found at the Brickilns without *Bowthant-Bar*, near *York*: and is preſerv'd in the *Muſæum Aſhmoleanum* at *Oxford*. It is ſuppos'd by ſome to be an *Urn*, by others to be a *Flower-Pot*. The *Clay* is of the Colour of *Hallifax-Clay* when Burnt; the *Potter*'s part is well perform'd, the *Face* being Boſſed from within with the Finger, when upon the *Wheel*; and ſome Strokes of *Red Paint*, about the Curls of the Hair, and Eye-brows; and Two *Red* Threads about the Neck. On the backſide of the Veſſel, a *Leaf*, is drawn in *Red*, which is ſtill very freſh; but no *Glazing*, neither upon the *Clay* nor *Red-Colour*; the *Face* upon the Veſſel is as large as that of a Middle-ſized Woman.

A Roman Wall *and* Multangular Tower *at* York; *by Dr.* M. Liſter; *n.* 149. *p.* 238.

XIII. Carefully Viewing the *Antiquities* of *York*, the Dwelling of at leaſt *Two* of the *Roman Emperors*, *Severus* and *Conſtantine*. I found a part of a *Wall* yet ſtanding, which is undoubtedly of that Time; it is the South-Wall of the *Mint-yard*, being formerly an Hoſpital of St. *Lawrence*, looking towards the River: It conſiſts of a *Multangular Tower*, which did lead to *Botham Barr*, and about ..... Yards of a *Wall*, which ran the length of *Coning-Street*, as he who ſhall attentively view it on both ſides may Diſcern.

The Outſide, towards the River, is faced with a very ſmall *Saxum Quadratum* of about 4 *Inches* thick, and laid in Levels like our *Modern Brick-Work*: but the Length of the Stones is not obſerv'd, but are as they fell out in Hewing. From the Foundation 20 *Courſes* of this ſmall *Squared Stone* are laid, and over them 5 *Courſes* of *Roman Brick*; theſe *Bricks* are laid ſome length-ways, and ſome End-ways in the *Wall*, and were call'd *Lateres Diatoni*: After theſe 5 *Courſes* of *Brick*, other 22 *Courſes* of ſmall *Square*

Stone (as before deſcrib'd) are Laid, which raiſe the Wall [illegible] Feet higher; and then 5 more *Courſes* of the ſame *Roman-Bricks* are overlaid, beyond which the *Wall* is Imperfect, and Capt with *Modern* Building. Note, that in all this Height there is no *Caſement* or *Loop-hole*, but one Entire and Uniform Wall, from which we gueſs the *Wall* to have been Built ſome Courſes higher after the ſame Order. The *Bricks* were to be as *Thoroughs*, or as it were ſo many new Foundations to that which was to be Superſtructed; and to Bind the two ſides together firmly; for the *Wall* it ſelf is only Faced with Small *Square Stone*, and the Middle thereof filled with *Morter* and *Pebble*.

Vitruvius commends *Brick-Building* before *Stone* even for the Duration: and therefore to excuſe it, he gives a Reaſon why the *Romans* ſuffer'd not *Brick-buildings* to be made within the City of *Rome*, as a thing not of Choice, but Neceſſity. The *Law* (ſays he) ſuffers not a *Wall* to be made to the *Streetward* (for ſo give me leave to interpret *communi Loco*) above a Foot and a Half thick, and *Partition Walls* the ſame, leaſt they ſhould take up too much *Room*, Now *Brick-Walls* of a Foot and a half thick (unleſs they were *Diplinthii* or *Triplinthii*) cannot bear up above one Story. And therefore when a Plain *Area* or Building of one Story, could not receive ſuch a Multitude to dwell in the City, the Houſes of Neceſſity were Raiſed Higher, and they had ſtrange Contrivances of out-jetting, and over-hanging Stories, and *Balconies*, &c. which Reaſons if rightly conſidered are great Miſtakes: Our Men at this Day have Demonſtrated that a Firm Building may be raiſed to Many Stories height upon a Foot and a Half thick Wall. The overſight of the *Romans* was the vaſt Bigneſs of their *Brick*, for the leſſer the *Brick* the Firmer the Work; their being much greater Firmneſs in ſuch a multitude of Angles, as muſt be produced by a *Small Brick*, then in a Right Line; and this is the Reaſon of the Strength of *Butreſſes*, and *Multangular Towers*, &c.

Thoſe *Bricks* are about 17 *Inches* of our Meaſure Long, and about 11 *Inches* Broad, and 2 *Inches* and a *half* Thick. This (having cauſed ſeveral of them to be carefully Meaſur'd) I give in Round Numbers, and do find them to agree very well with the Notion of the *Roman Foot*, which the Learn'd Antiquary *Greaves* has left us; *viz.* of its being about *Half an Inch Leſs than Ours*. They ſeem to have ſhrunk in the *Baking*, more in the Breadth than in the Length; which is but Reaſonable, becauſe of its eaſier yielding that way: and ſo for the ſame Reaſon, more in Thickneſs; for we ſuppoſe them to have been Deſigned in the *Mould* for 3 *Roman Inches*. This Demonſtrates *Pliny*'s meaſures to be True, where he ſays, *Genera Laterum tria*; Didoron, *quo utimur*, *longum* Seſqui-Pede, *Latum* Pede; and not thoſe of *Vitruvius*, as they are extant: The Copy of *Vitruvius* where it deſcribes the Meaſures of the *Didoron* being vitious. And indeed all that I have yet ſeen with us in *England* are of *Pliny*'s Meaſures; as at *Leiſter* in the *Roman Ruine* there, call'd the *Jews Wall*; and at St. *Albans*, as I remember, as well as here with us at *York*: So that the *Single Brick-wall* was only allowed as Standard, *viz.* a Foot and a half Thick Wall, or one *Roman Brick*

a length. And therefore it is but reasonable we should make *Vitruvius's Longum Pede, Latum* Semipede, a fault of *Vitruvius's* Coppyers.

I shall only Add this Remark, That *Proportion*, and a Plain *Uniformity*, even in the Minutest parts of Building, is to be observ'd; as this miserable *Ruine* of *Roman Workmanship* shews. In our *Gothick Buildings* there is a total neglect of the Measure, and Proportion of the *Courses*: As tho' that was not much Material to the *Beauty* of the Whole; whereas indeed in Nature's Works it is from the *Symmetry* of the very Grain, whence arises much of the *Beauty*.

XIV. I have added to my *Roman Curiosities* Two entire *Urns*, both of the *Blewish-Grey-Clay*, but of Different Forms, with some of the *Burnt Bones*: and Two other Vessels of *Red-Clay*; the Lesser of them is almost in the Form of the *Roman Simpulum* or *Guttus*, and by the Narrowness of the Neck seems rather to have been a kind of *Lacrimatory*, or Vessel for some kind of *Liquid* Matter, rather than *Ashes*; the Other was part of an *Aqueduct*, and is turned in the form of a *Scrue* on the Inside, and has a narrow Neck at One End, to put into the Open end of the Next, and several of these (each a *Foot* Long and 4 *Inches* Broad) were found thus placed in the *Roman Burying Place* at *York*, by the River-side, out of *Boutham Bar*, which our Learned Dean, Dr. *Gale*, tells me signifies *Burning* in the *British Language*, and 'twas Indisputably the Place the *Romans* made Use of to that End, as appears by the great Number of *Urns* there frequently found, when they Digg the *Clay* for *Bricks*. And that it Continued the place of their *Sepulture* after that Custom of *Burning*, introduced in the Tirannous Dictatorship of *Scylla*, was abolished, is Evident by a remarkable *Hypogæum* without any *Urns* in it, discovered the last Winter 1696; 'twas large enough to contain Two or Three *Corpses*, and was *Paved* with *Bricks* nigh Two *Inches* thick, eight in Breadth and Length, being Equilaterally Square, upon which was a Second *Pavement* of the same *Roman Bricks* to Cover the Seams of the Lower, and prevent the working up of Vermin. But those that Covered the *Vault* were the most remarkable that ever I saw, being about Two *Foot* square, and of a proportionable Thickness. I have also a 3*d* sort of *Roman Bricks*, which I discovered in the *Ruines* of *Kirkstall-Abby*, two Miles from *Leeds*, which come the nighest those mentioned by *Vitruvius*, being 8 *Inches* broad, and almost Double the Length. I have also Two sorts of *Chequered Pavements*; one of about 3 *Inches* square, the other (of those found at *Aldborough*) not above *half* or one 4*th* of an *Inch*, and of *Different Colours*.

Several Roman Antiquities *about* York *and* Leeds; *by Mr.* Thoresby. *n.* 234. *p.* 738.

XV. I have procured part of the *Bottom* (which consisted of Several such Pieces for the conveniency of *Baking*) of an old *Roman Coffin*, that was lately dug up in their *Burying Place* out of *Boutham-Bar* at *York*. 'Tis of the *Red-Clay*, but not so Fine as the *Urns*, having a greater quantity of Course Sand wrought in with the Clay. As to the Form (which is entire as it was at first *Moulded*) 'tis 14 *Inches* and a *half* Long, and about 11 Broad,

A Roman Coffin *and other* Roman Antiquities *and* Coins; *by Mr.* Ralph Thoresby. *n.* 244. *p.* 310.

Broad, at the Narrower End, and nigh 12 and a *half*, at the Broader; This was the Loweſt part, for the *Feet*, and the reſt were propotionably Broader till it came to the *Shoulders*; 'tis an *Inch* thick beſides the Ledges, which are one Broad and Two Thick, and extend from the bottom of either Side to within 3 *Inches* of the Top, where 'tis wholly Flat, and ſomewhat Thinner for the next to ly upon it; which Several parts were thus joyn'd together by ſome *Pin*, I preſume, for at the End of each *Tile* is a *Hole* that would receive a common *Slate-Pin*. Theſe Edges are wrought á little Hollow, to receive the Sides, I ſuppoſe, and at the *Feet* are two contrary Notches to faſten the *End-piece*. This *Bottom* I ſhould conclude to have conſiſted ſtrictly of 8 ſuch Parts, from a like Character 8 Impreſt upon the *Clay* by the *Sandapilarius*'s Finger before its *Baking*, but that I ſomewhat doubt whether *Numeral Figures* be of that *Antiquity* in theſe *European* Parts. I got alſo ſome Scars of Broken *Urns*, dug up in Mr. *Giles*'s Garden, which are of the *Fineſt Clay* I have ſeen, with which was found a *Roman Shuttle*, about 3 *Inches* and an *half* Long, but not *one* Broad in the very Middle: the Hollow for the *Licium* being but one *4th* of an *Inch* in the broadeſt place, ſhews that it was either for *Silk* or very *Fine Linnen*, perhaps their *Asbeſtinum* or *Incombuſtible Winding Sheets*. I have alſo lately Procured a *Roman Pottle* from *Aldbrough*, which is of the *Red-Clay*, but much Courſer than the *York-Urns*: I take it to be ſtrictly the *Half* of their *Congius*, and comes the nigheſt Mr. *Greaves*'s Computation, containing 3 *Pints* and an *Half* the *Wincheſter-Meaſure*.

Vid. Sup. Vol. I. *Cap.* I. *Sect.* XXVII.

I have received 22 *Old Roman Coins*, from Mr. *Townely* of *Townely*, which were lately found in the Pariſh of *Burnley* in *Lancaſhire*. Many of them are *Conſular*, or *Family Coins*, one of them, *viz. Q. Caſſius*, was 162 Years *ante Chriſtum* according to *Goltzius*'s Method, being ſtrictly the ſame he places *A. U. C.* 589. That they were the ancient *Roman Denarii*, and *Coin'd* before the *Emperors* Times (notwithſtanding the contrary Sentiments of ſome Learned Men) I think, is Evident, becauſe there is moſtly, inſtead of the *Emperor's Head*, the Antick Form of the *Caput Urbis*, without Inſcription; beſides, *Tacitus* calls theſe *Bigati* and *Quadrigati*, *Pecuniam Veterem ac Diu notam*; Again, others have upon them ROMA, which I find not uſed by any of the *Emperors*, (except thoſe ſmall Pieces upon the *Tranſlation* of the *Empire* to *Conſtantinople*); again, the Letters in theſe are often interwoven, as particularly V—L in one I have of *L. Valerius Flaccus*. *A. U. C.* CDXCII. which according to *Goltzius*, is the *7th*. Year after the *Romans* firſt Stampt *Silver Monies*; and to mention no more, many are of the *Serrato's* filed in ſmall Notches round the Edge, of which ſort I have of *Scipio Aſiaticus*, *&c.* and other *Conſular* Pieces: but I never ſaw any of a Later Date.

A Roman Pavement *near* Roxby *in* Lincolnſhire; *by* M. Abr. de la Pryme. *n.* 263. *p.* 565.

XVI. *Aug.* 1. 1700. I went with Mr. *Place* and Mr. *Nevill* of *Winterton*, to *Roxby* (a little Town on the Weſt of the Famous *Roman Way* which runs from *Lincoln* to the *Humber* ſide) to view a *Roman Pavement* lately diſcovered there by one *Tho. Smith* as he was digging to repair a Fence.

The

The Close, or Garth, where this piece of *Antiquity* is found is in the Town on the South-West of the Church. We Bared about a Yard and half Square, in doing which we cast up many pieces of *Roman Tile*, the *Bone* of an Hinder Leg of an Ox or Cow, broken in two, and many pieces of *Plaister* Painted *Red* and *Yellow*, which seemed to have been the *Cornish* at the Foot of some *Altar*, or else perhaps of some part of the *Building*; and we observed that several Great Stones in their Falling (when the Building over this *Pavement* was Destroyed) had Broken and Lodged themselves in the *Pavement*, and there lay untill we removed them. The *Pavement* it self looked exceeding *Beautifull* and Pretty: and yet the *Stones* which Composed it were nothing but Small four Square bitts of *Brick*, *Slate*, and *Cauk*, set in curious *Figures* and *Order*, and are only of 3 Colours, *Red*, *Blew*, and *White*. The Material that these small *Stones* is set in, is a Floor of *Lime* and *Sand*, and not *Plaister*. The whole *Pavement* consists of *Circles* and *Quadrangular*, and many uneven *Figures*, with *Rows* of the aforesaid *Stones*: in some of which *Circles* and *Figures* were *Urns*, in others *Flowers*, in others Interchangeable *Knots*, according as the Workman Pleased.

XVII. I have got into my hands a very large and fair *Roman Altar* of One Entire Stone, which was but a very few Years ago Discovered upon the South Bank of the River *Tine*, near the *Sheilds* in the *Bish.* of *Durham*. The Stone it self is of a course *Ragg*, the same with that of the *Pyramids* at *Burrow-Briggs*. It is 4 *Foot* High, and was ascended to by *Steps*, which appeareth in that all the Sides, but the *Front*, have two Square Holes near the Bottom, which let in the Irons that Joyn'd it to the *Steps*.

A Roman Altar; *by Dr.* M. Lister. *n.* 145. *p.* 70.

On the Backside, opposite to the *Inscription*, is Engraven *in Basse-Relief* a *Flower-Pot* furnished, I suppose with what pleased the *Stone-Cutter*: for these Men needed not to be more Curious than the *Priests* themselves, who were wont to make Use of Herbs next Hand to Adorn the *Altars*; and therefore *Verbenæ* is put for any kind of Herb. Yet if we will have it resemble any thing with us, I think it most Like, if not Truly *Nymphæa*, a known and common *River-Plant*. On One of the Sides, which is somewhat Narrower than the Front or Back, are Engraven in *Bass-Relieve*, the *Cutting-knife* (*Cesespita*) and the *Ax* (*Securis*). The *Knife* is exactly the same with that on the other *Altar* mentioned above: but the *Ax* is Different; for Here it is Headed with a Long and Crooked Point, and there the Head of the *Ax* is Divided into 3 Points. On the Other Side are Engraven after the same manner an *Eure* (*Urceolus*) and a *Ladle*, which serve for a *Sympullum*. This I call rather a *Ladle*, than a *Mallet*, it being perfectly *Dish-wise* and Hollow in the Middle; altho' *Cambden* is of another Opinion in that elegant Sculpt of the *Cumberland-Altar*. And the very same *Utensil* I have seen and noted on the *Ickley Altar*, which is yet extant at *Middleton Grange* near that Town. The *Plane* of the Top is Cut in the Figure of a *Bason* (*Discus* or *Lanx*,) with *Ansæ* on each side, consisting of a pair of *Links* of a *Chain*, which rest upon, and fall over two Rowles; And this was the *Hearth*. The *Front*, hath an *Inscription* of 9 *Lines* in *Roman*

Fig. 7.

Fig. 8.

Vid. Sup. Sect. IX.

Fig. 9.

Fig. 10.

Fig. 11.

Roman Letters, each *Letter* a very little more than two *Inches* Deep of our Meaſure, now Remaining as in the *Sculpture*; which I would Read thus, *Dis Deabuſque Matribus pro Salute M. Aurelii Antonini Auguſti Imperatoris — Votum Solvit lubens lubens merito ob Reditum.*

The *Deæ Matres* are well interpreted by *Selden*. It is much his *Safety* and *Return*, both Vow'd, ſhould be ſo Separated in the *Inſcription*. *Caracalla*, ſay the Hiſtorians, after his *Father's Death* at *York*, took upon him the Command of the Army *Alone*, and the whole *Empire*; He went *Alone* againſt the Enemy, who were the *Caledonii* Inhabiting beyond the *Wall* which his *Father* had Built. He made Peace with them, Received their Hoſtages, Slighted their Fortify'd Places, and Return'd. And this ſeems to be Confirm'd by the *Inſcription*; for undoubtedly upon this laſt Expedition of him *Alone*, without his Brother *Geta* and *Mother*, was this *Altar* Erected to him *Alone*, at a place about 2 *Stations* on this ſide the *Wall*. So that the Vow might be as well underſtood of his *Return* from this *Expedition*, as for his *Safety* and *Return* to *Rome*; which methinks ſhould be True, or his *Mother* and Brother *Geta* would ſcarce have been left out, at leaſt ſo early. For yet the Army declared for them *both*, according to their *Father's Will*.

Further, it ſeems alſo to have been Erected by thoſe who Flattered him, and who were afterwards Kill'd by him; and for this Reaſon the Perſons Names, who Dedicated it, ſeem to me to be Purpoſely Defac'd, the *6th* and *7th Lines* of the *Inſcription* being Deſignedly Cut away by the Hollowneſs of them, and there not being the leaſt Sign of any *Letter* remaining, and this I ſuppoſe might be part of their Diſgrace, as it was uſual to Deface and Break the *Statues* and *Monuments* of Perſons *Executed*, of which this *Monſter* made ſtrange Havock.

There is another reading of Part of the two *firſt Lines*, which I do not Diſallow, but that it will Agree well enough with the Hiſtory of *Severus*, tho' his *Apotheoſis*, or Solemn *Deification*, was not perform'd till he came to *Rome*, in the Manner of which *Funeral Pomp*, *Herodian* is very Large; it was of that excellent Antiquary Dr. *Johnſon* of *Pomfret*. CONSERVATORI. B. PROS, *&c.* as it follows in Mine, Which ſhews the Height of Flattery of thoſe Times. So that they paid their Vows to the lately *Dead Father* the *Conſervator* of *Britain*, for the *Safety* of the *Son*; and the Story tells us how gladly he would have had him made a *God* long before, even with his Own Hand.

Two Roman Altars *in* Northumberland; *by Mr.* Ralph Thoresby. *n.* 231. *p.* 663. *Fig.* 12.

XVIII. Dr. *Cay* of *Newcaſtle* has ſent me the Copies of two *Roman Altars*. The former of them was taken out of the *Roman Wall* not far from *Collerton*, or *Chollarton* *, and may tempt us to believe that the Old *Procolitia*, which was the *Station* of the *Cohors prima Batavorum*, was rather *There*, which is an Important Place, (where the River *Tine* interrupting the

* *Prope* Collerton Cilurnum. *Notitia Dignitatum Imperii*; *eſt tamen* Procolitia *alius Locus à* Cilurno.

Courſe

Course of the *Wall*, it was but necessary that the *Ford* should be *Secured* by making one of the *Cohorts* keep that *Station*, and 'tis but 2 *Miles* and a *half* from *Carrow*, (where the *Altar* now is in the Possession of Mr. *Forster*) than at *Pruddow*, which is at least 10 *Miles* Distance where Mr. *Cambden* seem'd to Fancy it. The other is at *Blenkingsop* † *Castle* in *Northumberland*, which I take to have been Dedicated by *Lucius Annius* to the *Goddess Nymphs Old* and *Young*, and particularly to the *Debonair* (if *Urbana* be taken appellatively) *Mansueta Claudia*; for thus I Read it, DEABVS NYMPHIS *Veteribus* ET *Junioribus* MANSUETAE CLAVDIAE VRB*anæ*, *Nuncupavit Hoc Lucius Ann* IVS; and thereby the Defects in the Stone seem to be supply'd with a right Number of Letters in each Vacuity.

Fig. 13.

† *Prope* Blenkenshop & Widen, Vettii *Circa hæc Loca* Fontes. *Utrumque Nomen hoc indicat.*

XIX. Dr. *Lister* in the *Year* 1683. exactly Designed the *Roman Inscriptions*, *Fig.* 14. 15. 16. 17. 18. 19. 20. according to the *Originals* now to be seen at *Bath* in *Somersetshire*. The Letters of *Fig.* 15. 16. 17. are 5 *Inches* Compleat.

Some Roman Inscriptions; *by Dr.* M. Lister. n. 155. p. 457.

Fig. 14, 15, 16. 17, 18, 19, 20.

Fig. 21. contains the *Inscription* of an *Altar* found near the *Roman Camp*, which is placed within the Angle where the 2 Rivers *Medloe* and *Erwin* Meet, a little Mile S. W. of *Manchester* in *Lancashire*, and Preserved in the Garden of the Worshipful *Edw. Moseley de Holme Armiger*.

Fig. 21.

XX. *Oct.* 26. 1696. I got a Sight of an *Altar-piece*, Dug up at *Chester*, about 3 Years since, and is now in the Custody of one Mr. *Prescot*.

A Roman Altar *at* Chester; *by Mr.* Edmund Halley. n. 222. p. 316.

The following *Inscription* thereof is pretty Entire, but Roughly Cut in the *Stone* of the Place *, which is Soft and Mouldring, nor capable of Long Continuance when it is Exposed to the Air.

* *Vid. Sup. Vol.* II. *Cap.* III.

PRO. SAL. DOMIN
------IM NNINVI
CTISSIMORVM
AVGG. GENIOLOCI
FLAVIVS LONG—— *I suppose* VS *there not being*
TRIB. MIL. LEG XX. *Room for* INVS.
LONGINVS FLA
VIVS DOMO
SAMOSATA
V. S.

By the Title of *Domini nostri* given to the *Emperors*, it appears, that this *Inscription* was of the *Bas Empire*, not before *Diocletian*, nor yet so late as *Theodosius*, it being *Pagan*. The *Stone* it self is about 32 *Inches* High, 16 in Breadth, and 9 Thick; On the One End is Engraven, not very Curiously, the Resemblance of a *Genius*, holding a *Cornu Copia*; on the Other is a

Flower-Pot ſomewhat Better Perform'd, but a little Endamaged by the Softneſs of the Stone. The Backſide, Oppoſite to the *Inſcription*, is adorn'd with a pretty ſort of *Feuillage*, deſigned to fill up the Vacant Space. On the Top, in a pretty deep Cavity, is a Full Face of a Man, almoſt ſuch as they Paint the *Sun* or *Full-Moon* withal, with a Cap upon his Head, of which as yet I cannot comprehend the Deſign.

Some Roman Inſcriptions *found near* Durham; *by Mr.* Chr. Hunter n. 266. p. 657. *Fig.* 22.

XXI. Theſe *Inſcriptions* were found near to a Village call'd *Lancaſter*; about 5 *Miles* North Weſt from *Durham*, which I am fully perſwaded has been the *Longovicum* of the *Romans*. This Place has been a very conſiderable Place in theſe Parts, and their *Watling-ſtreet* lies through it. 'Tis on the Top of a Hill, which has a Deſcent on Three Sides; Towards the Weſt it is over-look'd by a High Hill, and almoſt Eaſtward from it about a Quarter of a *Mile*, ſtands the preſent *Lancheſter*, a Tolerable Country Village, with a pretty Church, which before the *Reformation* was Endow'd with a *Deanery* and *6 Prebends*. The Form of this Place has been Square, and Fortify'd with a Thick, Strong, Stone Wall Faced with Hewen Stone. Within the Wall are (and have been formerly) nothing but Ruinous Heaps of Stones; as alſo without the Wall too, eſpecially towards the Eaſt. 'Tis probable the Buildings Within the Wall have been all Publick, ſuch as the *Station* for the *Soldiers*, *Temples*, *Palaces*, &c. or (which I am more enclin'd ro think) there has been nothing but the *Lodging* of the Garriſon Within the Wall. This I rather ſuppoſe, becauſe the *Inſcription* of *Gordianus* was not found here, but about a Hundred Yards from the Wall towards the Eaſt, near which place the Largeſt Stones are found: and I my ſelf above a Year ago found part of a Large *Earthen Urn*, near this Place, within which I ſuppoſe there had been a Leſſer, ſuch I remember was found at another Village not far from this, which I am perſwaded has been another *Colony*. There is no doubt but this *Colony* has been Adorned with many Beautiful *Palaces*, and other Sumptuous Buildings; and perhaps the *Balneum cum Baſilica*, mention'd in one of theſe *Inſciptions* has been That ſo long in vain ſought for at *Rome*.

Some Roman Coins by *Mr.* Ralph Thoresby. n. 241. p. 208.

XXII. I have procured ſome of the *Roman Coins* Lately Plow'd up about *Nottingham*; but they prove Common, and moſt of *Tetricus*, tho' ſome alſo of *Gallienus*, *Victorinus*, and *Claudius Gothicus*.

Molds for Coining *or* Counterfeiting Roman Money; *by Mr.* Thoresby. n. 234. p. 739.

XXIII. Mr. *Clark* (the Lady *Cambden*'s Lecturer at *Wakefield*) has brought me ſome very Fair *Coins*, or rather *Impreſſions* upon *Clay*, which he reſcu'd from ſome Labourers, who in Delving in the Fields near *Thorp on the Hill*, found a conſiderable Number of them. At firſt we could not imagine for what Uſe they were Deſign'd, but upon a ſtricter View, it appears plainly, they were for the *Coining*, or rather *Counterfeiting*, of the *Roman Moneys*, that Wretched Art it ſeems being in Vogue 1500 Years ago, for they are indiſputably of that Antiquity, and are really very Dexterouſly done. They have Round the *Impreſſion* a Rim, about half the Thickneſs of the *Roman Silver*

Silver Penny, in each of which is a little Notch, which being joyn'd to the like Nick in the next, makes a round Orifice to pour in the Metal. Each of theſe has either Two *Heads*, or as many *Reverſes*; ſo that placing one, for Example with *Alexander Severus*'s *Head* on one ſide, and his Mother *Julia Mammæa*'s on the other, betwixt two pieces with *Reverſes*, it compleats both; ſo that one with *Heads*, and another with *Reverſes*, are placed *alternatim* for a conſiderable Length, and then all paſted over with an Outer Coat of *Clay*, to keep the Metal from Running out, and a little Ledge on either ſide the Orifice, to convey the Metal into the long Row of Holes. They are all of *Emperors* about the ſame Age, when indeed the *Roman Moneys* were notoriouſly Adulterated, as is obſervable in any Collection of their *Coins*, though ſome of them Now are ſo Scarce, particularly a *Duodumenianus*, that I Queſtion whether this Age can Produce One to take a Copy of.

XXIV. The Ancient *Romans* had Three Words, *Scutum*, *Parma*, and *Clypeus*, for that Defenſive Weapon we generally *Engliſh* a *Shield*, which notwithſtanding their Different Forms or Matter, their Authors (eſpecially in the Declenſion of the *Empire*) frequently Confound, as, if I miſtake not, we do *Shield*, *Buckler* and *Target*. Of theſe *Shields* or *Bucklers* I have One of the *Parma* kind, and rightly ſo call'd, *quod è Medio in omnes partes ſit Par*; whereas the *Scutum* was moſtly *Oval*, tho' ſometimes *Imbricatum*, with Corners equally broad; it is 15 *Inches* Diameter, whereof a little more than a 3*d* part is taken up with the *Umbo*, or Protuberant Boſs at the Navel, which is made of an Even Convex Plate, wrought Hollow on the Inſide, to receive the *Gladiator*'s Hand; upon the Center of This is a Leſſer Boſs, wherein there ſeems to have been fix'd, ſome kind of *Cuſpis*, or ſharp Offenſive Weapon, to be uſed when they came to Fight Hand to Hand, but the Form of this I cannot deſcribe, both my *Shields* being Defective in that Point. From the ſaid *Umbo* the *Shield* is 4 *Inches* and a *half* broad on each ſide, in which are 11 Circular Equidiſtant *Rows* of Braſs *Studs* of that Size, that 222 are Set in the Utmoſt Circle, which is 4 *Foot* wanting 3 *Inches*, (for that is the *Circumference* of the *Buckler*) and ſo proportionably in the Leſſer Circles. To the Center of theſe 11 *Rows* of Brazen *Studs*, the Inmoſt Circle is placed upon the *Umbo* it ſelf, the next 8 upon as many Circular Plates of *Iron*, each a 3*d* of an *Inch* Broad. The two Outermoſt upon One Thicker Plate an *Inch* broad. In the little Intervals between theſe Circular Plates are plainly diſcovered certain *Croſs Laminæ*, that paſs on the Back of the other, from the *Umbo* to the Exterior Circle; and theſe *Iron* Plates are alſo about the 3*d*. part of an *Inch* at the broader end towards the Circumference, but gradually Contracted into a narrower breadth, that they may be brought into the Compaſs of the *Umbo* at the Center. The Inner Coat next to thoſe *Iron* Plates is made of very Thick, Hard, Strong *Leather*, which Cuts Bright, ſomewhat like Parchment. Upon that is a Second Cover of the ſame, and on the Outſide of this are Plaited the *Iron Pins* that run through the *Braſs Studs*; for the above-mention'd *Braſs Studs* are Caſt pure-

A Roman Shield; *by* Mr. Thoresby. n. 24. p. 205.

Fig. 23.

ly for Ornament upon the Heads of the ſaid *Iron Pins* the *6th* part of an *Inch* long, that none of the *Iron* appears. The next Cover to the plaiting of the ſaid *Nails* (which paſs through the Circular and Croſs *Iron* Plates, and both the *Leather* Covers) is a pure Linnen Cloth, but Diſcoloured, though perhaps not with Age only, but Sower Wine and Salt, or ſome other Liquid, wherein it ſeems to have been Steeped. And laſtly upon the ſaid Linnen is the outmoſt Cover, which is of ſofter *Leather*. All which Coats that Compoſe the *Sheild*, are bound together by two Circular Plates of *Iron*, a Thin and Narrow one towards the Center, and a Thicker and Large one, an *Inch* Broad, at the Circumference; which is curiouſly Nail'd with two Rows of very ſmall Tackets, above 400 in Number, the vacant Holes whence ſome of the *Nails* are dropt out, are little bigger than to admit the Point of a pair of ſmall Compaſſes; both which *Rims* do likewiſe faſten the *Handle* (the *Only* Part of *Wood*) which has alſo 6 other *Iron Plates*, about 3 or 4 *Inches* Long, to Secure it.

I lately procured another *Sheild* which Differs from This not ſo much in *Size* (though it is compleatly a *Foot* Larger in the Circumference) as in the *Form*: For whereas This already Deſcrib'd is almoſt *Flat*, except the Swelling *Umbo*, This is abſolutely *Concave*, and from the Skirts of the Protuberant Boſs in the Middle it Riſes gradually to the Circumference, which is nigh 3 *Inches* Perpendicular from the Center; This has 14 *Rows* of the like Braſs *Studs*, but the *Circular Plates* of *Iron* they are fix'd in, do not lie upon other *Croſs Plates*, as the former does, but each from the Center, upon the Outer Edge of the other, which occaſions its Riſing in that *Concave* manner.

That Theſe were part of the Accoutrement of the *Roman Equites*, rather than either the *Velites* or *Haſtati*, I conclude, becauſe that, though all in General had *Shields*, yet thoſe of the *Velites*, who were as the *Forlorn Hopes*, ſeem more Slight, and are expreſsly ſaid to be, *è Ligno Corio ſuperinducto*; thoſe of the *Haſtati* are not only ſaid, *è pluribus Lignis & Aſſerculis conſtit.* &c. but were alſo 4 *Foot* Long, to Cover the whole Body, when ſtooping; of which kind were likewiſe thoſe of the *Principes* and *Triarii*. Whereas the Deſcription, that the Anonymous Author of *Roma Illuſtrata* with *Fabricius*'s Notes, gives in his *Armatura Equitum*, comes the nigheſt this, *Scutum ſive Parmam habebant ex Bovillo Corio, arte leviter Durata*, but then he adds, *eoque mero nulla materia ſubjecta*, omitting not only the Ornamental *Studs*, but the *Iron Work*, which *Camillus* firſt contriv'd as a Defence againſt the immenſe Swords of the *Gauls*.

The Roman Way *called* High-ſtreet *in* Lincolnſhire; *by* M. Abr. de la Pryme. n. 263. P. 561.

XXV. The *Roman Way* in *Lincolnſhire*, which is call'd all along by the Country People the *High-ſtreet*, runs (if I miſtake not) almoſt directly in a Straight Line from *London* to *Humberſide*. It is but *Slightly* mention'd by Mr. *Cambden* as Running (*ſays he*) from *Lincoln* Northwards into the little Village call'd *Spittle in the Street* and ſomewhat further: I ſhall therefore Continue its *Courſe* unto *Humber*. This *Street* is Caſt up on both ſides with Incredible Labour to a great Height, and Diſcontinu'd in many places, and then

then Begun again. I obſerv'd where it Runs over nothing but bare Mould and Plain *Heath*, that there it conſiſts of nothing but *Earth* Caſt up, but where it comes to Run through *Woods* there it is not only Raiſed with *Earth*, but alſo *Paved* with great *Stones* ſet Edge-way, very cloſe to one another, that the Roots of the Trees that had been Cut down to make way for the ſame, might not Spring up again and blind the Road. Which *Pav'd Cauſway*, is yet very Strong, Firm, and Viſible in many places of this *Street*, where *Woods* are yet Standing on both ſides, as undoubtedly they were in the *Roman* Times, elſe it had not been *Paved*, and in other places it is *Paved* where nothing of any *Wood* is Now to be ſeen, though undoubtedly there was when it was Made. In one place I meaſured the Breadth of the ſaid *Paved Street*, and found it juſt 7 *Yards* Broad, *Engliſh* Meaſure.

This *Street* in its Courſe full North, as afore-ſaid, runs by the Fields of *Hibberſtow*, [which perhaps ſignifies the Place where the *Daniſh* General *Hubba* was Bury'd] in which Fields, not far off this *Street*, is the Foundation of many *Roman Buildings*, to be ſeen; as is manifeſt, from their *Tile* there Found: and Tradition ſays, That there hath been a City and Caſtle there, and there are two Springs, the one call'd *Julian's Stony Well*, and the other *Caſtleton Well*; and there are Several *Old Roman Coins* now and then found there. This might perhaps be ſome little Old *Roman Town* by their *High-way* ſide, and was perhaps in after times, before that it was Ruin'd, call'd *Caſtletown*, or *Caſterton*, from its being Built upon, or by ſome of their *Camps* that might then be in thoſe Fields. About a *Mile* further to the North-ward on the Weſt ſide of the ſaid *Street*, upon a great Plain or Sheep Walk, there is very Viſible the *Foundations* of another *Old Town*, though now there is neither Houſe, Stone, Rubbiſh, Tree, Hedge, Fence or Cloſe to be ſeen belonging thereto. I have counted the *Veſtigia* of the Buildings, and found them to amount to about *one Hundred* that are yet Viſible, and the Number of the *Streets* or Lanes are 4. or 5. and not far from it North-ward is a place call'd the *Kirk-garth*, where the Church is ſuppos'd to have ſtood that belong'd to this Town. Tradition calls this Place *Gainſtrop*, and I have read in the *Monaſt. Angl.* of Lands and Tenements herein given unto *Newſted Priory*, not far off this place, in an Iſland in the River *Ank*, falſly call'd *Ankham*.

Hibberſtow.

Vol. 2.

About a *Mile* or two hence the *Street* runs thro' *Scawby Wood*, where it is all *Paved*, and from thence cloſe by *Eroughton* Town End, by a Hill which I ſhould take to be a *Barrow*, and that the Town had its Name from it, quaſi *Barrow Town*, but that it ſeems to be too Exceſſively Great for one. However, I have found Fragments of *Roman Tiles* and *Bricks*, there: which with its Situation ſo near this *Cauſway*, make it ſeem to be of *Roman Original*. The *Retfords* were Lords of it ſeveral Ages, until that Sir *Henry Retford* or *Radford* Knight, (with the *Earl* of *Rutland*, the Lord *Clifford*, the Lord *Clinton* and others) about the Year 1455. loſt it by *Attainder* of *High-Treaſon*. One of which *Retfords*, call'd Sir *Henry*, but whether the fore-going or no, I cannot yet well tell, laid formerly in *Effigy* of White Marble all in Armour, with his Lady by him, in a Small Quire in the North

Broughton.

n. 266. p. 6. 7.

North ſide of the Chancel of the Church of the ſaid Town; but was Remov'd in the Memory of Man out of the ſame, and laid in an Arch within the Communion Rails, and their Room and Place taken up to be the Burying-place of the Worthy Family of the *Anderſons*, now Lords of the Mannor (who are deſcended from Sir *Edm. Anderſon* Knight, Lord Chief Juſtice of the *Common-Pleas*, in Queen *Elizabeth*'s Days, Famous for his Uprightneſs and Love to the Church; whoſe Anceſtors lived at *Flixburrow* in this County) in which is the Effigies to the Life of Sir *Edmund Anderſon* Baronet, moſt curiouſly cut in White Marble lying upon a great *Altar-Tomb*, adorn'd with many *Arms* and *Inſcriptions*.

a. 263. p. 563. From thence the *Cauſway* all along *Paved* is Continu'd about a *Mile* further to the Entrance upon *Thornholm-More*, where there is a place by the *Street* call'd *Bratton Graves*, and a little Eaſt, by *Eroughton Woodſide*, is a *Spring* that I diſcover'd ſome Years ago that turns Moſs into *Stone*; and not far further ſtands the *Ruins* of the Stately *Priory* of *Thornholm*, Built by King *Stephen*. Oppoſite to this *Priory*, about a *quarter* of a *Mile* on the Weſt ſide of the *Street*, is a place call'd *Santon*, from the *Flying Sands* there, which have Over-run and Ruin'd above 100 *Acres* of Land. Amongſt theſe Sands was that great *Roman Pottery* mention'd by Dr. *Liſter*. I found there ſeveral *Roman Coins*, and Mr. *B.* of *A.* found a great piece of Braſs in the bottom of one of the *Furnaces* like a Croſs, which perhaps was part of a *Grate* to ſet ſome Pots on while they were Baking or Drying. Returning back to the *Street*, there are ſeveral Sand Hills, ſomewhat like *Barrows* thereby, on the Top of one of which was Erected a great Flat Stone, now ſo far ſunk in the Earth, that there is not above a Foot of it to be ſeen. Entring then into *Appleby Lane*, the *Street* leads thro' the Weſt End of the Town, at which Town is two Old *Roman Games* yet Practiſed, (tho' very imperfectly) the one call'd *Julian's Bower*, and the other *Troy's Walls*. From hence it runs ſtraight on, leaving *Roxby*, a little Town *half* a *Mile* on the Weſt, and *Winterton*, a pretty neat Town (where the Worthy Families of the *Places* and *Nevils* Inhabit,) and then about 3 or 4 *Miles* further, leaving *Wintringham* about half a *Mile* to the Weſt, the ſaid *Street* falls into *Humber*, and there Ends; at which End has been a Town call'd *Old Wintringham*, and a ſort of a Beach for Ships. All this End of the Country, on the Weſt ſide of this *Street*, hath been full of *Romans* in Old time, as may be gathered from their *Moneys*, *Coins*, and the many *Tiles* and *Bricks* that are commonly here found, eſpecially at a Cliff call'd *Winterton Cliff*, where has been ſome Old *Roman Buildings*; and further about 2 *Miles* more Weſtward is *Alkburrow*, which ſeems to have been a *Roman Town*, not only from its Name, but alſo from a Small Four-ſquare *Camp* or *Entrenchment* there, on the Weſt ſide of which is a *Barrow*, call'd *Counteſs Barrow*, or *Counteſs Pit*, to this Day, Sunk Hollow in the Middle.

Vid. Vol. II. *Cap.* III. *Sect.* XL. *vid. Sup. Sect.* IX.

A ſtrange Well *and ſome* Antiquities *found at* Kirkbythore; *by* Mr. Tho. Machil. n. 158. p. 555.

XXVI. A *Strange Well* was lately diſcover'd by the Foot of an Horſe, which ſtumbled upon it, in the common Road through *Kirkbythore* in *Weſtmoreland*; 'tis about 10 Yards from the River *Troot-beck*, and as many from

the

the great *Roman Cauſeway*, which leads to *Carlile*, and goes betwixt it and a place call'd the *Burwens*, being part of the *Ruines* of *Whelp-Caſtle* on the Eaſt ſide of it; perhaps the *Caſtle Walls* have gone betwixt it and the River, and the Way run through it, as at *Maiden-Caſtle* on the top of *Stanemore*. It hath been covered with a Plank of Wood (I ſuppoſe of *Oak*,) about 9 *Inches* thick, in the faſhion of a Potlid; but Decay'd and Macerated to the Colour and Conſiſtence of a *Peat* or Turfe: and above this was Gravel and Pavement about a *Yard* thick. Inſtead of *Walls*, there were two large *Wooden Veſſels*, one upon another, like Hogſheads, or Wine-pipes, with Bung-holes in them, about 5 *Inches* Diameter: and the Plowings for the Heads were fair to be ſeen. They were made of *Firr* (whenceſoever they came) above an *Inch* thick; each of them in Depth, by a Perpendicular, 6 *Foot* at the leaſt, at the Heads in Diameter. 2 *Ft.* 8. *In.* and in the Middle, 3 *Ft.* 5$\frac{1}{3}$ *In.* At the Bottom, about 5 Yards Deep, were 4 Planks of Wood, laid Quadrangular wiſe, ſupported with a Stone at every Corner, to bear up the Fabrick, and let in Water through the Gravel and Sand, which lay looſe in the bottom about a *Yard* Deeper, The Wood of the Veſſels and the Planks were *Sound* (though the Cover was *Rotten*) becauſe not ſo much Expoſed to the Air.

The Workmen Flattered themſelves with the Hopes of ſome *Treaſure* but they only found ſome *Old Earthen Veſſels*, with pieces of *Urnes*, one piece of a *Drinking Glaſs*, and ſeveral *Sandals*. The *Earthen Veſſels* were of very *Fine Metal* (if I may ſo call it) of a *Erick like* Colour, and in ſeveral Forms; but the moſt (and moſt Remarkable) were, like a *Baſon*, or *Poſſet-Cup*; the Bowl, Semiglobular; the Foot, a Ring: ſome were in Diameter about 8 *Inches*, and in Depth on the inſide, more than 3$\frac{1}{2}$; ſome more, ſome leſs, as appeared by the *Fragments* which came unto my Hand. They were (for the moſt part, very Finely *Imboſſed*; but 3 more eſpecially, *viz. One* with a *Vine-Branch*, having a Figure in every Turning, and in the *firſt place* a *Naked Man* ſtanding alone upon the Left Foot, the other Leg Croſs, and holding his Left Hand down towards his Back, his Right towards his Belly with a Branch of *Lawrel* of 3 Sprigs in it, one of which Turns up to his Face-wards over the Crook or Bending of his Arm; and at his Feet is a Branch of Lawrel and a Bloſſom or Flower: In the *next* is a Vine Leaf, 2 Bloſſoms at the Bottom; and at the Top 2 Peacoks Regardant. In the *next* is a *Victory* (as I take it) *viz.* an Angel or *Genius* holding in its Right Hand (the Arm ſtretched out, and the Face looking towards the *Man*) a Garland of Lawrel; in the Left a Sprig of the ſame; and two Sprigs likewiſe are at the Foot with Flowers or Bloſſoms, and one Flower in the Middle betwixt the Garland and one of thoſe Sprigs: In the *Next* is a Vine-Leaf the ſame as before, in the next is *Victory*, and ſo by turns, till it ends with a Vine Leaf next the *Man*. And upon it are alſo ſome *Goth-like* Characters of the *Leſſer* ſort, but dim and obſcure. *Another* of theſe *Pots* is Adorn'd with Circles and Semicircles, in one of theſe Circles is the Figure of a *Man*, Sitting on a *Plinth* or Square Stone; in all the reſt are fluttering *Genii*. In ſome of the Semicircles are *Lions* and *Geats* (or ſome ſuch like Creatures) Fig. 24.

Creatures) here one, and there another; all ſingle and Current: and near the bottom are *Stags* in Courſe and *Gray-hounds* purſuing, with an In-
Fig. 25. ſcription (in a *Goth-like* Character of the *Greater* ſort) which ſee *Fig.* 25. This may be *Paulini.* An *Inſcription* with the like Characters, is to be ſeen at *Burrow-Brigg*, and publiſht by Dr. *Liſter.* And they have been Careful in Preſerving Theſe; for This and ſome other, having been broke, are Cramm'd (or rather Soldered) with Lead. The *3d.* Sort is yet far more beautiful than any of the Reſt, being adorn'd with *Gray-Hounds* very well Moulded, and in full Purſuit of *Stags* and *Hinds*, and the *Wild-Boar*; upon which I diſcover'd the ſame *Inſcription*, as in the other. And tho' I am not ſo vain, as to ſay this relates to *Our Coats* of *Arms*, yet having ſo near an Affinity with it both in *Creſt* and *Charge*; (*a.* the *Stag's Head*; *b.* 3 *Gray-Hounds Current*; *c. Whelp-Caſtle*;) and being found at the place which we came from (as is ſaid and believ'd) I cannot but take ſome Notice of it. There were ſeveral other Broken *Inſcriptions*; and one above the reſt upon
Fig. 26. the bottom of a Plain Diſh or Platter (on the inſide of it) writ as in *Fig.* 26. but whether it ſtands for *Veſpaſian Imperator*, or *Domitianus*, or neither of them, I cannot tell.

As to the *Glaſs*, there was but a very ſmall Fragment of it, I can ſcarce gueſs the Figure, but I think it a *Flute-Glaſs* made like a Tunnel or Spire inverſed. It hath been as Thick as a Barly Corn.

The *Urns* were of a *Leaden Colour* inclining to *Black*; one had been Large, 2 *Inches* thick in the ſide of the Pot, but how Big I know not, for there was a Sherd only brought to me. The Top was in Diameter from out-ſide to out-ſide 7 *Inches*, of which the *Roll* is 2 *Inches*, and the *Mouth* 3 *Inches*; The *Neck* yet Straighter, and only $\frac{1}{3}$ of an *Inch* thick. And many ſuch are found at this Town, ſome of which have *Ears* and *Handles* as Thick as my Arm-wriſt, and their *Heads* and *Mouths* much of this bigneſs, but Thicker and Stronger. But the other was almoſt Entire and whole, tho' a very ſmall one; in Height $8\frac{1}{2}$. *Inches*, in Diameter $6\frac{1}{2}$, at the Mouth almoſt $3\frac{1}{2}$, and in the Neck more than $2\frac{1}{2}$. The Bottom well nigh as Big as the Top excepting the Ring, and the Body in Thickneſs the *5th* part of an *Inch*: but Thicker ſomewhat at the Top and the Bottom.

The *Sandals* were ſome for *Men*, ſome for *Women*, and ſome for *Children*; all
Fig. 27. Shaped by their Feet, Spreading more to the Outſide than to the Inſide: and ſome were very Large and ſome Crooked as *g.* The Leather was Freſh of which they were made, but very Tender when it came to be Spread upon a *Laſt.* Each conſiſted of 3 principal parts; an *Upper-Leather* (or rather *Heel-piece* with two *Tabs* on each ſide) an *Inner Soal*, *a.* Long $11\frac{1}{2}$ *Inches*, Broad $3\frac{3}{4}$; of 3 or 4 *Soals* Stitched together with Leathern Thongs; and an *Outer Soal*, *b.* of 2, ſtuck full of *Nails* with little round Heads (ſo Decay'd and Rotten, that I could ſcarce diſcern them to be Iron) Plated on the Inſide: and to the *Upper Leather* (3 Fold in the *Heel-piece*, *c.*) is fix'd betwixt them and Sowed with Leather or rather Tacked, which the Iron *Nails* do help to Defend. Yet I think ſome *Womens* (of the better ſort) had no *Nails* at all, *d.* And of theſe there is one well worth the Obſervati-

on,

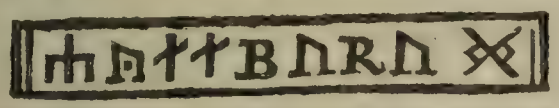
in, of *Spaniſh-like* Leather, and curious Workmanſhip, *f.* being exactly Stitch'd Down round about the *Fore-piece* long $2\frac{1}{3}$ *Inches* with a pretty Label, *e.* of the ſame piece Hanging from it, for Faſhion-ſake ſurely; ſince 'tis too ſlender to be of any Uſe. As ſmall in the String as the 15th part of an *Inch*. The *Tongue* at the End, Broad *half* an *Inch*, Long one *Inch*, betwixt the two Flouriſhes, which is the Length of the Small String, 8. parts in 10, of an *Inch*, the two Flouriſhes take up the reſt. It is a long time ſince any *Sandals* were worn in this Country: and I am well inform'd that *theſe* are very different from the *Broagues* of *Ireland* and the *Highlands* in *Scotland*; For Thoſe have but *One Single Soal*, and Theſe have *Six*.

XXVII. The *Runic Inſcription* at *Beaucaſtle* in *Cumberland* (communicated by the Lord *Will. Howard* to Sir *H. Spelman*) appears to have been formerly much Larger than * *Wormius* has given it: But it is now ſo miſerably Defaced that in 6 or 7 Lines, none of the Characters are fairly Diſcernible, ſave only; ᚿᚨᛏᚺ R.; and theſe too are Incoherent, and at great Diſtance from each other. However, this *Epiſtylium Crucis* (as Sir *H. Spelman* has call'd it) is to this Day a Noble *Monument*. 'Tis one entire *Free-Stone* of about 5 *Yards* in Height, Waſhed over (as the *Font* at *Bridekirk*,) with a White Oily Cement, to preſerve it the better from the Injuries of Time and Weather. The Figure of it inclines to a Square Pyramid; each ſide whereof is near 2 *Foot* Broad at the bottom, but upwards more Tapering. On the *Weſt* ſide of the Stone, we have 3 fair *Draughts*, which evidently enough Manifeſt the *Monument* to be *Chriſtian*. The loweſt of theſe repreſents the Portraiture of a *Layman*; with an Hawk or Eagle perch'd on his Arm. Over his Head are the fore-mention'd *Ruines* of the Lord *Howard's Inſcription*. Next to theſe, the Picture of ſome *Apoſtle*, *Saint* or other *Holy Man*, in a *Sacerdotal* Habit, with a *Glory* round his Head. On the Top ſtands the Effigies of the *B. V.* with the *Babe* in her Arms; and both their Heads encircled with *Glories* as before.

On the *North*, we have a great deal of *Chequer-Work*; ſubſcribed with the following *Characters*, fairly Legible.

Runick Inſcriptions at Beaucaſtle; *by Mr.* Will. Nicolſon. n. 178. p. 1287.

* *Mon. Dan.* p. 161.



Upon the Firſt Sight of theſe *Letters*, I greedily ventured to Read them *Rynburu*: and was wonderfully pleaſed to Fancy, that this Word thus Singly Written, muſt neceſſarily betoken the Final Extirpation and *Burial* of the *Magical Runæ* in theſe Parts, reaſonably hoped for, upon the Converſion of the *Danes* to the *Chriſtian* Faith. For that the *Danes* were anciently groſs *Idolaters* and *Sorcerers*, and that they brought their *Paganiſm* along with them, is beyond Controverſy. This Conceit was the more Heighten'd, by reflecting upon the Natural *Superſtition* of our *Borderers* at this Day, who are much better Acquainted with, and do more firmly Believe, their Old Legendary Stories of *Fairies* and *Witches*, than the Arti-

cles of their *Creed.* And to Convince me yet further that they are not utter Strangers to the *Black-Arts* of their Fore-fathers, I accidentally met with a Gentleman in the Neighbourhood, who ſhewed me a Book of *Spells* and *Magical Receipts*, taken (2 or 3 Days before) in the Pocket of one of our *Moſs-Troopers*: wherein among many other *Conjuring* Feats, was Preſcrib'd a certain Remedy for an *Ague*, by applying a few Barbarous Characters to the Body of the Party Diſtemper'd. Theſe methought were very near a-kin to *Wormius*'s RAMRUNER, which, he ſays, Differ'd wholly in *Figure* and *Shape* from the Common *Runæ.*

But if this Conjecture be not Allowable, I have another ſomething (it may be) more Plauſible. For if, inſtead of making the 3*d* and 4*th Letters* to be two, ᚴ·ᚴ·ᚺ·ᚺ· we ſhould ſuppoſe them to be ᛏ·ᛏ· E. E. the Word will then be *Ryeeburu*; which I take to Signify in the old *Daniſh* Language, *Cæmeterium*, or *Cadaverum Sepulchrum.* For though the True old *Runic* Word for *Cadaver* be uſually written ᚼᚱᚨᛏ *Hrae*; yet the *H* may, without any Violence to the *Orthography* of that Tongue, be Omitted at pleaſure; and then the Difference of Spelling the Word, here at *Beaucaſtle*, and on ſome of the Ragged *Monuments* in *Denmark*, will not be great. And for the Countenancing of this Latter Reading, I think the above-mention'd *Chequer-Work* may be very Available: ſince in that we have a Notable Emblem of the *Tumuli*, or *Burying-Places* of the Ancients. (Not to mention the early Cuſtom of Erecting *Croſſes* and *Crucifixes* in *Church-yards*: which perhaps being well Weighed, might prove another Encouragement to this 2*d* Reading.) I know the *Chequer* to be the *Arms* of the *Vaux's*, or *de Vallibus*, the Old Proprietors of this Part of the North, but that I preſume will make nothing for our Turn: Becauſe this, and the other Carv'd Work on the *Croſs*, muſt of neceſſity be allowed to bear a more ancient Date, than any of the *Remains* of that Name and Family; which cannot be Run up Higher than the *Conqueſt.*

On the *Eaſt*, we have nothing but a few *Flouriſhes*, *Draughts* of *Birds*, *Grapes* and other *Fruits*: All which I take to be no more than the Statuary's Fancy.

On the *South*, *Flouriſhes* and *Conceits*, as before; and towards the Bottom, the following Decay'd *Inſcription.*

The Defects in this ſhort piece are Sufficient to Diſcourage me from attempting to Expound it. But (poſſibly) it may be Read thus:

Gag Ubbo Erlat, i. e.
Latrones Ubbo Vicit.

I confeſs this has no Affinity (at leaſt, being thus Interpreted) with the Foregoing *Inſcription*: but may well enough Suit with the manners

of

of both Ancient and Modern Inhabitants of this Town and Country.

XXVIII. The Fabrick of the *Font* at *Bride-kirk* in *Cumberland* does, I think, fairly enough Evince that it is now uſed to the ſame Purpoſe for which it was at firſt Deſign'd. For on the *Eaſt* ſide of this Stone, we have fairly Repreſented a Perſon in a long *Sacerdotal* Habit *Dipping* a Child into the Water; and a Dove (the Emblem, no doubt of the *Holy Ghoſt*,) hovering over the Infant. Now I need not here obſerve that the Sacrament of *Baptiſm* was anciently Adminiſtred by *Plunging* into the Water, in the *Weſtern* as well as *Eaſtern* Parts of the *Church*, and that the *Gothick* Word ΔΑΠΤΙΖΑΝ (*Mark* 1. 8. and *Luke* 3. 7, and 12.) the *German* Word taufen, the *Daniſh* Døbe, and the *Belgick* doopen, do as clearly make out that Practiſe, as the *Greek* Word Βαπτίζω: Nor, that they may all ſeem to be Deriv'd from [δύπτειν] another Word of the ſame Language and Signification; and are evidently a-kin to our *Engliſh*, *Dip*, *Deep*, and *Depth*. Indeed our *Saxon* Anceſtors expreſſed the Action of *Baptiſm* by a Word of a Different Import from the reſt: For in the fore-mention'd place of St. *Mark*'s Goſpel, Their *Tranſlation* has the Text Thus: Ic eop pulliġe on pætepe. he eop pullaþ on halġum ġaſte. 7. 1. *Ego vos Aquis Baptizo; ille Vos Spiritu Sancto Baptizabit.* Where the Word **pullian** or **pulliġean** ſignifies only ſimply *Lavare*: Whence the *Latin* Word *Fullo*, and our *Fuller*, have their Original. But from hence to Conclude that the *Saxons* did not uſe *Dipping* in the Sacrament of *Baptiſm*, is ſomewhat too Harſh an Argument.

On the *South* ſide of the *Stone*, we have this *Inſcription*:

ᚴR· IᚠᚪRI: ᚼᛏ: ᛦ: IᚠRᚬᚴᛏ: ᛚ: ᛏᚼ:
ᚦIᛁ: ᚿᛏ: RÐ: ᚷIR: ᛏR: ᛦ: BRᚬᚴᛏ:

Now this Kind of *Characters* are well enough known, (ſince *Ol. Wormius*'s great Induſtry in making us acquainted with the *Literatura Runica*) to have been chiefly uſed by the *Pagan* Inhabitants of *Denmark*, *Sweden*, and the other *Northern Kingdoms*; and the *Danes* are ſaid to have Swa m'd moſtly in theſe Parts of our *Iſland*. Which two Conſiderations ſeem weighty enough to perſwade any Man, at Firſt Sight, to Conclude that the *Font* is a *Daniſh Monument*. But then on the other hand, we are ſufficiently Aſſured, that the *Heathen Saxons* did alſo make Uſe of theſe *Runæ*; as is plainly Evident from the frequent mention of Runcpæptiġen and Runptapap in many of the *Monuments* of that *Nation*, both in Print and Manuſcript, ſtill to be met with. Beſides, we muſt not forget that both *Danes* and *Saxons* are Indebted to this Kingdom for this *Chriſtianity*: And therefore thus far their Pretenſions to a *Runic* (*Chriſtian*) *Monument* may be thought Equal. Indeed ſome of the Letters (as Ð, ᚷ and ᛚ,) ſeem purely *Saxon* being not to be Met with among *Wormius*'s many *Alphabets*:

A Runick Inſcription *on the Font at* Bride-kirk; *by Mr.* Will. Nicolſon. n. 178. p. 1291

and the Words themſelves (if I miſtake them not,) come nearer to the Ancient *Saxon Dialect*, than the *Daniſh*. However let the *Inſcription* ſpeak for it ſelf.

Er Ekard han men egroctten. and to dis men red wer Taner men brogten. i. e.

Here Ekard *was Converted*; *and to this Man's Example were the* Danes *brought.*

Who this *Ekard* was is a Queſtion hard to be anſwer'd. The proper Name it ſelf is ordinary enough in the *Northern Hiſtories*; though variouſly Written: and 'tis certainly a Name of Valour, as all others of the like Termination; ſuch as *Bernhard*, *Everhard*, *Gothard*, *Reinhard*, &c. So that it may well become a *General*, or other great Officer in the *Daniſh* Army: and Such we have juſt Reaſon to believe Him to have been, who is here Drawn into an Example for the reſt of his Country-men.

Han men egroctten; which render'd *Verbatim*, is *have Men Turn'd*, i. e. *was Turned*, is a Phraſe to this Day very familiar in moſt *Dialects* of the ancient *Celtick Tongue*; though loſt in our *Engliſh*. In the *High-Dutch* 'tis eſpecially obvious; as *Man Saget*, *Man hat gelagt*, *Man Lobet*, &c. And the *French* Impersonals (*On dit*, *on fait*, &c.) are of the ſame Strain; and evident Arguments that the *Teutonick* and *Gauliſh Tongues* were near A-kin.

The Characters ⸸ ⸸ and ⸸ are manifeſt Abrevations of ſeveral Letters into one: of which ſort we have great Variety of Examples in ſeveral of *Wormius*'s Books: And ſuch I take the Letter Ð to be inſtead of Ꝺ and Ꝑ; and not the *Saxon* Ð. I muſt believe ⅂ to be borrowed from the *Saxons*: and ⸮ I take to be a Corruption of their Ƿ or W. The Reſt has little of Difficulty in it. Only the *Language* of the whole, ſeems a mixture of the *Daniſh* and *Saxon Tongues*: but that can be no other than the natural Effect of the two Nations being Jumbled together in this Part of the World. Our *Borderers*, to this Day, Speak a *Leaſh* of *Languages* (*Britiſh*, *Saxon*, and *Daniſh*) in One; and 'tis hard to Determine which of thoſe 3 Nations has the greateſt Share in the *Motly Breed*.

An Antient Monument *at* Foultſham *in* Norfolk *by Sir* P. S. n. 189. P. 361.

XXIX. In the Church-Yard at *Foultſham* in *Norfolk*, there is a *Tombſtone* with this *Inſcription*, which ſome of the Learned in theſe Curioſities may perhaps Explain.

On *One Side* ᚪᚴ ᚳᚩᚷ ᚷᚩᚩ

At *One End* ᚩᚩᚩ

On the *Other Side* ᚠᚦᛈ ᚦᛈᛊᚹᛈᚪ

On the *Other End* ᛒᚩᚷ

Some Saxon Coins *found* in Suffolk; *by Sir* P. S. n. 189. P. 356.

XXX. 1. In *May* 1687. at *Honedon* nigh *Clare* in *Suffolk*, the *Sexton*, as he was Digging a Grave in the Church-yard Deeper than ordinary, met with a *Skull*, and near it many Pieces of *Saxon Money*, which are generally of the Same bigneſs, *viz.* of a *Groat*, and about the ſame Weight: But the

the *inſcriptions* are ſo *Various* that there are ſcarce Two of them alike. I gueſs this *Variety* of *Inſcriptions* ariſeth from the many *Maſters of the Mint*, who were appointed to *Coin Money* in ſeveral Places, and who might each of them have a Different *Stamp*. For I have obſerv'd great *Variety* in *H.* 3. *Coin*, viz.

NICOLE ON LVND.
WILLEM ON LVND.
WILLEM ON CINT. *Canterbury.* quær.
RICHARD ON GLOV.

Theſe Names being probably the *Maſters* of the *Mints*, the Laws as to the *Mints* being not Altered. 1 *Hen.* VI. *Chap.* I. The *King's Council* might Aſſign *Money* to be *Coin'd* in as many Places as they will. (*a.*)

Theſe *Saxon Monies* were *Denarii*, or *Pennies*, which in *Ethelred's* time was the 20*th* part of the *Silver Ounce Troy*. Five of thoſe *Pennies* made a *Shilling*, and 240 of them made a *Pound*: which is the preſent Proportion of our *Penny* and *Pound*, tho' the Intrinſick Value be about Three to One Different. There were (they ſay) between 200 and 300 Pieces; If 240. *i. e.* 1 *l.* then it would ſeem probable that the Deceas'd might have order'd ſo many to be Bury'd with him, as a kind of *Expiation* for having Privately Kill'd a *Dane* of *Servile* Condition; for in *Ethelred's Law* there is this Penalty, *Servilis Conditionis* Dacum *ſi* Anglus *morte affecerit, integram ſolvito* Libram; If more, or leſs, was found, it might anſwer another *Mulct* enjoyn'd by the *Saxon Laws* for Killing or Maiming ſome Perſon of another Quality; or the *Æſtimatio Capitis* might be laid in the Grave with the Perſon that was Kill'd. However, it is very Probable, that the *Money* was *Bury'd* upon ſome Superſtitious Account. *Vid. Fig.* 28. Greaves *of the* Denar. *p.* 117. *Fig.* 28.

On ſome of theſe *Monies*, there are very Odd *Saxon Characters*. Some are Diminiſh'd in their Weight, by lying long under-ground, and ſeveral of them Colour'd *Green.* (*e.*) The *Reverſe* of the 13*th* is the ſame with the 12*th*. That of the 14*th* is written round the *Croſs*, ſo are thoſe of the 18, 19, 20, 21; whereas moſt of them are not ſo; but there are *Two Lines* of Letters with *Three Croſſes* Between them. The little *o.* in ſome of them is Periodical. The ⊢ in the 19*th* is a very Clear Character, and ſtands for a Letter that is not Defac'd.

In the 20*th Reverſe*, [*Sterling*, &c.] P & T. *paſſim confundi Docti obſervant* ϖέμπε *pro* ϖέντε, ϖολὴ, *pro* ϛολή &c. Ruſpina *pro* Roſtina, &c. Bochart. *Geogr. p.* 450. 706. Denarium & Sterlingum *eundum eſſe* Nummum, (Matth. Pariſ. *in* Hen. III. 13. Solidis & 4. Sterlingis *pro* Marcâ *qualibet computatis.*) *Vox ipſa* Sterling, *utrum formatur à Signo quod imprimebatur iſti* Nummo, & Sterlingus *ſit* quaſi Stellatus; *an potius* Eaſterlingus *denominatus à Populis, qui* Eaſterlings *dicuntur, ambiguum faciunt Scriptores.* Gronovius *de* Seſtertiis. *p.* 346. (*l.*) But I find *Gronovius* may be Corrected in what he Writes in the *Addenda* to the ſame *Treatiſe*, by this *Reverſe*, *Dubium non eſt* (ſays he) *ſi* Saxonibus Anglis *deberetur ea Vox*, Sterling *in* Monumentis

numentis *illorum repertam iri.* —— *Conſtat inter omnes, ante* Normannorum Ingreſſum *in* Angliam, *non reperiri mentionem hujus Vocabuli; cum ipſo* Gulielmo *primum Legi,* Sterlingos, *&c. appellatos, ergò his debetur ea Vox in* Anglia. Yet I believe what he Writes juſt before, Denariis *autem Nomen etiam* Sterlinges *fuiſſe, in Continente quâ* Normanni *imperabant, oſtendunt duo Reſcripta* Pontificum Romanorum *in Decreto* Gregorii; and he might well have Added, that the *Normans* borrowed of the *Franks* that Word *Sterling*, as well as *Deſcriptionem* Libræ *per* Solidos Denarioſque. But it may be, when *Gronovius* writ, no *Coin* nor *Monument* of *Antiquity* was then Diſcover'd in *England* that mention'd *Sterling* before *William* I. whoſe Name brings to my Mind, that on his *Coin*, *(n.) P.* is put for *W.*

Gloſs. Sir *H. Spelman* takes *Sterling* and *Denarius* to be the ſame; and he directs to the *Statute* made *An.* 1302. 31. *Edw.* I. wherein the *Penny* is call'd *Sterling*, and the Weight of the *Sterling* is 32 *Gr.* of Dry'd Wheat; (and I have weighed 32 *Gr.* of Wheat, and they are equal to 24 *Grains Troy* Weight, which is our *Saxon Penny.*) And *An.* 1496. 12. *Hen.* VII. *Cap.* 5. there is another *Statute* wherein the *Sterling* is of the ſame Weight.

I am credibly Inform'd, ſome of the *Egbert's* and *Ethelbert's Coin* were found amongſt them: thoſe I ſaw were *Ethelſtan's*, who began his Reign about the *Year* 925. *Edmund Etheling*, his Brother, (for I take the *Edmunds* to be his) who began his Reign 940; *Edred*, another Brother, who began his Reign 946.

Remarks; by W. W. *ib. p.* 361. 2. *(a.)* This *Law* was in force till *Henry* VII. who firſt, that I can find, *Quartered* the *Arms* of *England* with *France* in his Common *Silver Coins*, on their *Reverſes*: This, his Succeſſors have ſince follow'd; before they writ *Civit. London*; *Civitas Cantuariæ*; *Villa Caleſiæ*; the want of knowing this Cuſtom, has cauſed ſome Learned Men to miſtake ſome *Coins* of *Edw.* IV. with *Civitas Norwic.* on the *Reverſe*, for *Medals* Stampt in Memory of *Kett's Inſurrection*, by *Edw.* VI. *Golden Medals* in Memory of great Actions, are of Ancient Uſe amongſt us; witneſs that *Golden Coin* of *Edw.* III. where a *Shield*, with the *Arms* of *England* and *France* over a *Ship*, is Stamp'd, to ſhew his Title to the Kingdom of *France*, which he then Claim'd; yet this can hardly be ſhew'd in *Silver Coins* which then paſſed for *Current Money*: that ſeems to have been Peculiar to the *Greeks* and *Romans*, except ſome Inſtances of theſe Two Laſt Ages. The ſingle Exception of *Edw.* III. who *Quartered England* and *France* in his *Money* doth not weaken my Aſſertion, ſince it was Extraordinary, as a more Publick Proclamation of the Juſtice of that *Title* which he ſet on Foot againſt *Philip de Valois.*

(b) This *Reverſe* [*n.* 1.] is to be Read PENE FEHO; *i. e. Penny-Money*, a Duplication uſual amongſt the *Saxons*; ſo afterwards *Sterling Money*. *Feho* or *Feoh*, is a common Word for *Money*. St. *Mark* XII. 41. þa ſæt ſe Hælend ongen þæne tollſceamol, ȝeſcah hu þ folc hyra feoh; *Then ſate* Jeſus *over againſt the Treaſury, and ſaw the People put in* Money.

(*c.*) LAND

(c.) LAND WEHO [*n.* 2.] This was *Coined* in Memory of a *Land-Tax*, Raiſed by *Ethelſtan*, to ſupport his Wars againſt the *Danes* and *Scots*; againſt whom, eſpecially the *Scots*, he was always *Victorious*. This is the only *Ethelſtan*, who was ever King of *England*: But there was another *Ethelſtan* King of *Kent* only, Son to *Egbert*, who beat the *Danes* at *Sandwich* in *An.* 852.

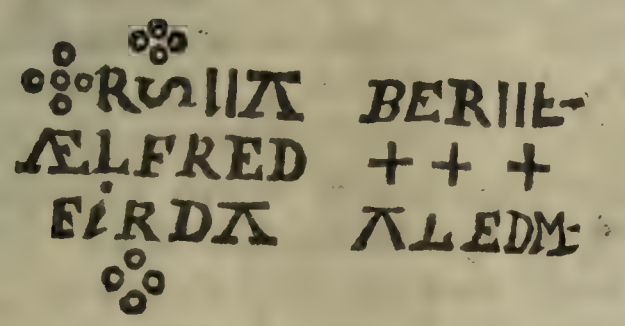
The *Variety* of *Letters* in theſe *Reverſes* is Remarkable: the laſt Word in theſe 2 *Reverſes* is manifeſtly to be Read alike, yet the Form of the Letters is vaſtly Different. This *Variety* aroſe from the Multitude of *Mints*, which did not all tye themſelves up to one *Stamp*, nor to the Same *Letters*.

A R E M (*d.*) This I ſhould Read [*n.* 4] *REgia Moneta*, to Diſtin-
+ + + guiſh it from the *Biſhop's* or *Abbot's*, for it was *Coin'd* at *Can-*
O N E T A *terbury*; A. I take to be a *Mint-Maſter*'s Mark.

(*e.*) Tho' theſe *Coins* as far as I can Judge are as good *Silver* as any *Current* with us, if not Better; yet ſince what *Alloy* is in them is of *Braſs*, I am apt to think, that the *Acid Steams* in a long Series of Ages ariſing from the *Human Bodies*, might Corrode ſo far into the Metal as to raiſe ſome little *Verdigreaſe* upon the Surface of the *Coins*; to which that *Greenneſs* is to be imputed.

(*f.*) Probably this *Albericus* [*n*, 7.] was a Noble-man, and they might have had the *Jus Monetæ* as well as *Biſhops* and *Abbots*; but I muſt confeſs I cannot make that out clearly. H. before G. is an uſual Tranſpoſition; ſo *HCotharius*, *H Ludowicus*.

(*g.* This I Read IVE MONETA, (*n.* 8.) or *Ive Money*, that is, *Money* Coin'd at S^t. *Ives* in *Huntingdonſhire*. The *H.* as alſo ⊓, both uſed for *M*, are Remarkable. *Bouteroüe*, in his Diſquiſitions on the Old *French Monïes*, gives us ſome *Gallick Epitaphs* from which he draws an *Alphabet* of the Old *Gauls*: In that *H* and ⊬, are uſed for *M*; ſo that poſſibly the *Britains* might likewiſe Uſe them. It is manifeſt they are not *Saxon Letters*; and I ſee no Abſurdity to allow the *Saxons* to have borrowed them from the *Britains*, and to have uſed them amongſt their own *Capitals*. There is a *Coin* in *Tab*, 3. *Coin* 14. of the *Collection* Prefix'd before *Ælfred's Life*, which has two other of thoſe *Gallick Letters* of which *Bouteroüe* has given us an *Alphabet*. The *Coin* is,



The ᔕ and Ⱡ are S and F in his *Alphabet*; and I am apt to think, that that *Inverſion* of *Letters* in theſe *Saxon Monies* as Ш for M, Ⱨ for

for ⊓,Ⱡ for F, took its Riſe from them; for in this *Alphabet* we have ⍋ and ▽ for D; ᔕ ᔆ and Z for S: however this will evince in ſome meaſure, the Practice of ſuch *Inverſions* which made ſome Learned Men take them for *Runic*, *Gothic*, or indeed for any *Characters* with which they were little acquainted.

(*h.*) [*n.* 9.] This and the *Reverſe* of 11, are to be Read alike; tho' they were *Coin'd* at different Places, as appears from the *Variety* of the *Letters*.

(*i.*) ⊓ which is uſed here for [*n.* 16.] for M, is frequently uſed in that *Collection* of *Saxon Coins* prefix'd to *Ælfred's Life*.

(*k.*) This *Gotæ Mone*, or God's Money, [*n.* 17.] was the *Peter-Pence* which was Collected Yearly, and ſent to *Rome*. *Ina*, one of the Kings of the *Mercians*, firſt gave it: thence it was conſtantly paid afterwards, tho' now and then Intermitted in the Heat of the *Daniſh* Wars. I ſuppoſe this *Coin* came out of an *Eccleſiaſtical Mint*.

(*l.*) The true Original of *Sterling* is *Starry*. The Common People obſerving the *Croſſes* upon the *Coins*, which look'd like ſo many *Stars*, call'd them *Sterlings*, *Starry* pieces. *Ling* is an *Adjective* Termination in the *Saxon Language*; ſo in time the word became *Subſtantive*, and was uſed promiſcuouſly for *Penny*..

(*m.*) The 19. and 21 *Reverſes* are to be Read alike, tho' poſſibly they might be made from Different *Stamps*. The *Letters* in both (for neither are very Clear) will mutually explain each other. I read it MΛ⊢ HEⵎHI HONE, or *Malmsbury Money*: The ⊦, which is an entire Letter, ſeems to have been taken from the Square B, or Ⲃ.

(*n.*) This Ƿ was the old *Saxon p*, or *W*; ſo it was *Willem*, not *Pillem*. The *Saxon Character* which was *Full* and *Plain*, gave Riſe to that ſmall Beautiful Character, which we uſually call the *Roman Letter*. The ancient *Romans*, for ought that yet appears to the contrary, wrote all with One Uniform *Character*, ſometimes Greater and ſometimes Leſs, of the ſame Figure with the *Great Letters* in our *Alphabet*. This they took from the *Greeks*; and it is Uſual in all the *Alphabets* of the *Oriental* Nations. The 3 *Inſcriptions* in *Gruter*, (*pag.* 185. 3. *p.*652. 2. *p.*182.7.) only Prove that they had our Small *t*, *p*, *b*, *h*, for we have no Hints in our *MSS.* of any others. After them Succeed the *Francick* or *Merovingian Character*, entirely Left off in Tranſcribing Books after *Charlemagne*. The *Notaries* kept it Longer; only by making it Longer, they brought it to ſomething like the *Italica*, to which it poſſibly gave Riſe. The Specimens in *Mabillon*'s Fourth Book, *de Re Diplomatica*, will put this paſt Doubt. All this while the *Saxon Character* was uſed in *England*, whoſe *Alphabet* is Evidently the ſame with the Small *Roman*, except ſome *Letters* which expreſſed Sounds Proper to Their *Language*, as Ꝺ, Ꝑ, ꝸ: Wherefore when *Alcuinus*, (Scholar to *Egbert*, Archbiſhop of *York*) went over into *France* to *Charles the Great*, and afterwards ſent for *Books* out of *Egbert*'s *Library*, as may be gathered from *William* of *Malmsbury*, he introduced that Fine Way of *Writing*, which immediately took place with all but the *Publick Notaries*. *Mabillon* owns the thing in Effect tho' he Diſſembles the *Original*: *Primâ Stirpe extinctâ*, Carolus M.

Literas

Literas expolire cœpit, aut certe jam tantisper expolitum Scripturæ *Genus à* Merovingico *in Elegantiorem Formam commutavit, quæ in eandem Formam evasit, quæ hactenus* Minuti Romani Characteris *Nomen retinet*, (*Lib.* 1. *Cap.* 11. *Num.* 10.) And if this Change was not wrought in a Moment, because the *Transcribers* used to the old *Merovingian Hand* conform'd it to the New, as much as they could, yet that wore off by Degrees; so *Mabillon*, *quæ* [Carolina Scriptura] *principio nonnihil* Merovingici Characteris *habebat intermistum*; *at subinde Politior effecta, in eandem formam*, &c. *Mabillon* acknowledges, that *Alcuin* introduced the Modern Punctuation into the *French* MSS. and *Records*, which he Learn'd from the *Saxons*, particularly [:·] for a full *Period*, as is manifest to all that shall look into the *Saxon* MSS. or Printed Books in Imitation of them.

Besides, all our *Latin* MSS. in *England*, till some time after the *Conquest*, were writ in the *Saxon Character*. So Archbishop *Parker* Publish'd *Asserius Menevensis*: and there are several *Latin* MSS in the *University Library* of *Cambridge*, written in the *Saxon Character*. And it is no Wonder that those *Letters* which expressed Sounds not used in the *Roman Tongue*, should be left out by the *French Transcribers*, who at the same time might use *Saxon Copies*: So that it is not strange *Vossius* should be Mistaken, when he thought Ω and Ð were from the *Greek*, and ⊖, who did not consider them to be both *Runick Letters*, which were introduc'd upon a particular Occasion, by *Chilperic*, who took them from the *Visigoths* in *Spain*, as *Wormius* (*de Literatura Runica*) has probably Proved from *Gregorius Turonensis*, and a *Constitution* of the same *Chilperic* Printed in *Goldastus*: yet I will not Deny, but *Theodore*, or some other of those *Greeks*, who in that Age had so great Intercourse with *England*, might introduce some *Greek Letters* to express those Sounds which they had not in their Own *Language*; from hence they were carry'd into *France*, with the rest of the *Saxon Alphabet*, and so into *Italy*; which *Mabillon* also in Effect acknowledges, when he says, *Hanc tamen Scripturæ Formam non* Franci *à* Romanis, *qui* Longobardicis *passim* Elementis *tunc utebantur*, *sed à* Francis Romani *accepisse videntur*.

3. Amongst the few *Coins* which I purchased of the *Sexton* of *Honedon*: I find these 3 not mention'd by Sir *P. S. vid. Fig.* 29.

An Addition by Mr. Sam. Dale. n. 203. *p.* 874. *Fig.* 29.

XXXI. 1. There was a curious Piece of *Antiquity* lately found at *Ashelney* in *Somersetshire*; the place where King *Alfred* Built, as *Milton* affirms, a *Fortress*, But according to *William* of *Malmsbury*, a *Monastery*, in Memory (as some have thought) of his Deliverance, Obscure Retreat to that place, and Concealment in it, from the *Danes*. The Work is so very Fine that some have Question'd its true Age: But in all Probability, it did belong to that great King. The Edge is thin, as far as the *Letters*. The *Letters* are on a plain Rising Obliquely. All within the inner Pyramidal Line is on a Plane equidistant from the *Reverse*. The Representation (in that upper Plane) seems to be of some Person in a Chair. It is in Enamel, covered over with a Chrystal; which is secur'd in its place by the little Leaves com-

A Piece of Saxon Antiquity found in Somersetshire; by Dr. Will. Musgrave n. 247. *p.* 441. *Fig.* 30.

ing over its Edges. In the *Reverſe* are Flowers engraved. The whole piece may be of the Weight of 3 *Guineas*. The Chryſtal and the Enamel excepted, it is all of pure *Gold*. This perhaps was an *Amulet* of King *Alfred*'s.

By Dr. Geo. Hicks. n. 250. p. 464.

2. This curious piece of *Saxon Antiquity* is in the Poſſeſſion of *Nathaniel Palmer* Eſq; of *Fairfield* in *Somerſetſhire*. The Air, the Shape of the Face, and the two United Scepters in each Hand of it, made me at firſt think that probably it might be that of our *Bleſſed Lord*; but having ſince ſeen a Picture of St. *Luke* in a moſt Ancient *Latin MS.* of the *Goſpels*, all written in *Capitals*, with ſuch like *Scepters* in Each Hand, I am inclined to think, that this was the common Way, in thoſe Times, of Drawing or Repreſenting *Saints* among the *Saxons*, and that the Picture in King *Alfred*'s *Antiquity* (for ſo I now call it) might be the Picture of his Patron St. *Cuthbert*, whom He, and his Mother both in one Night Dream'd they Saw, and Heard ſpeak the ſame Words, in which he told him he ſhould Conquer the *Danes*, and be a great King, and bid him be of good Courage. This Viſion of St. *Cuthbert*, happen'd to him after he was Beaten by the *Danes*, and had Retired in great Diſtreſs into *Athelny*, where this *Antiquity* was found; and He was ſo Affected with it, that he afterwards uſed to tell it all his Life long, and aſcribe his Succeſs over the *Danes* to the Merits of St. *Cuthbert*. And as the King uſed to commemorate the *Viſion* He and his Mother had of Him, ſo it is very likely he order'd this Picture to be made of Him, to Hang down by a String upon his Breaſt, for a conſtant Memorial of the *Saint*, who appear'd to him, to bid him give the *Danes* Battel in a time of great Deſpair, when he looked on himſelf as Conquer'd, and thought his Kingdom almoſt Loſt. That he cauſed the Picture to be made is plain from the *Saxon Inſcription*.

Will of Malmſbury.

AELFRED ME[HETI GEWYR[AN.

Aelfredus me juſſit Fabricari.

And that it was made to Hang down upon his Breaſt, is plain from the *Cone* or *Apex* of the *Figure*. And that the *Original* is a True and *Genuine Piece* of *Antiquity* is alſo Clear beyond all reaſonable Doubt, not only from the Place, where it was found, the Place of King *Alfred*'s Retreat from the *Danes*, which he *Fortify'd* in time of War, and where he Built a *Monaſtery* in Time of Peace; but alſo from the *Inſcription*, which is all, except *two*, in *Roman* or *Gallo-Italick Letters*, which the King, who was bred at the *Engliſh* School in *Rome*, prefer'd before thoſe of the *Saxon Duct*; and when he came to be King, as *Ingulph* Teſtifies, he brought them into uſe. Some I hear have ſuſpected this *Antiquity*, becauſe of its extraordinary Artifice, which they think too Fine for that Age. But it is not to be Doubted, but that King *Alfred*, who was ſo great a Prince, could eaſily procure the beſt Artiſts of that Age from all Parts of the Chriſtian World by the Correſpondence and Intereſt which He had at *Rome*.

Fig. 11.

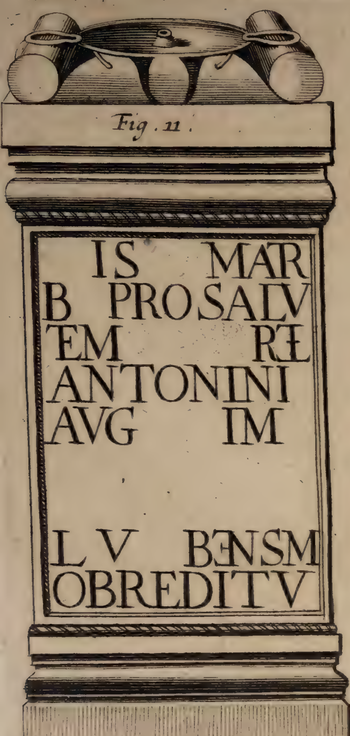


Fig. 14.

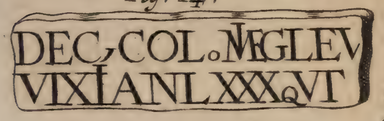


Fig. 15.

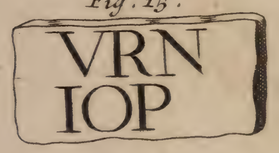


Fig. 16.

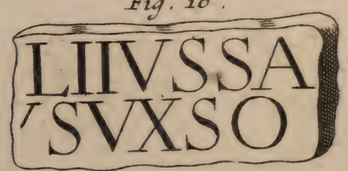


Fig. 17.

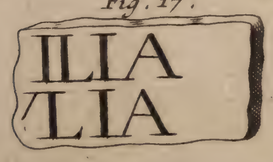
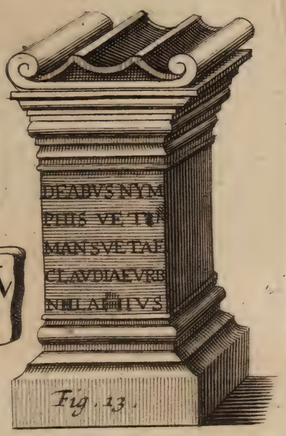


Fig. 12.

Fig. 13.



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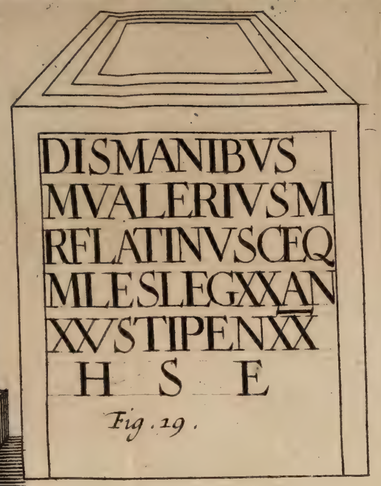


Fig. 20.

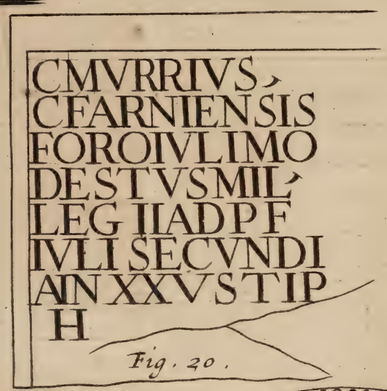
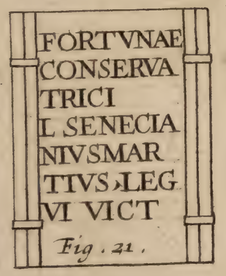


Fig. 21.



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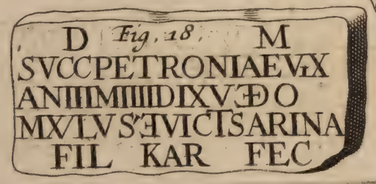

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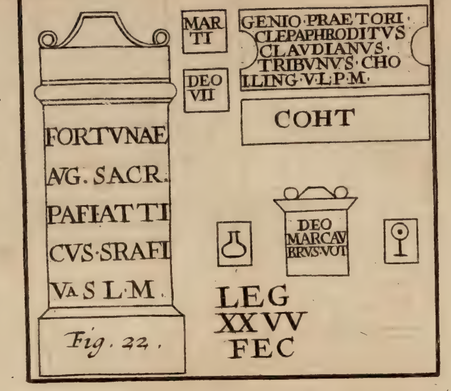

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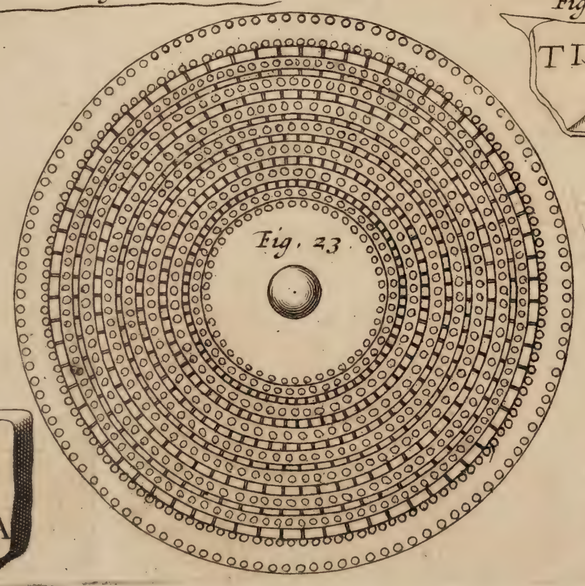


Fig. 24.

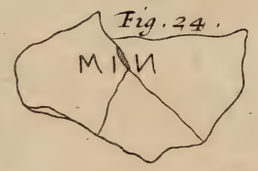


Fig. 25.

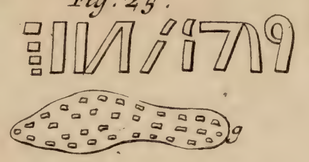


Fig. 26.

Fig. 27.

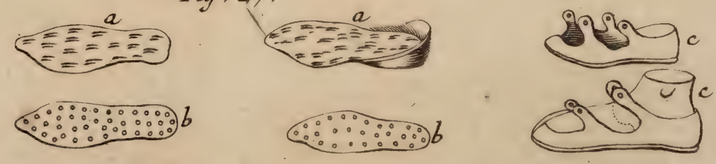


Fig. 28.

Pag. 442.

	Revers
I ÆÐELSTAN RE+	P NE + + + FEHO (b)
II ÆÐELSTAN RE+	LAND + + + ⟡EHO (c)
3 wt 23 grains ÆÐELSTAN RE+	STEF + + + ANVS
4 24. gr. ÆÐELSTAN RE+	AREM + + + ONETA (d)
5 21 gr. EADMVND RE+	BENE + + + DICTVS
6 16 gr. EADMVND RE+	MAN + + + ANO
7 19 gr. EADHVND RE+	ALB + + + ERIHG (f)
8 EADMVND RE+	IVEH + + + NETA (g)
9 EADMVN RE+	NTIL + + + HAH (h)
10 24 gr. EADMVND RE+	MERA + + + ATENO
11 EADMVN RE+	LITIL + + + WAN
12 EADMVND RE+	MAN + + + MANO
13 EADMVND RE+	
14 EADHVND REPT+	
Edmundi facies REIHGRHZIOH +	
15 EADMVND RE+	E RH O+O HO
16 24 gr. EADMVND REX	INGEL + + + GARH (i)
17 25 gr. EADHYND RE+	GOTAE + + + HOIIE (k)
18 +EADRED RE+ 21 gr.	
Edredi facies FREDRED MONETA+	
19 +EADRED RE+	
Edredi facies MANEEH INNO+ (m)	
20 + EADRED	
Edredi facies ZPERLINL ⊔ONE	
21 +EADRED REX 24 gr.	
Edredi facies IIMHECHINONE (m) +	

Fig. 29.

Fig. 30.

The Roman Abacus out of Marcus Velserus

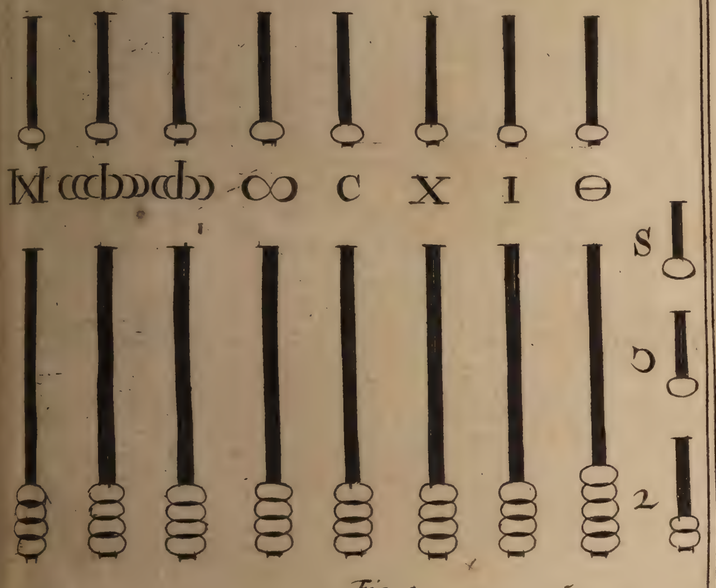
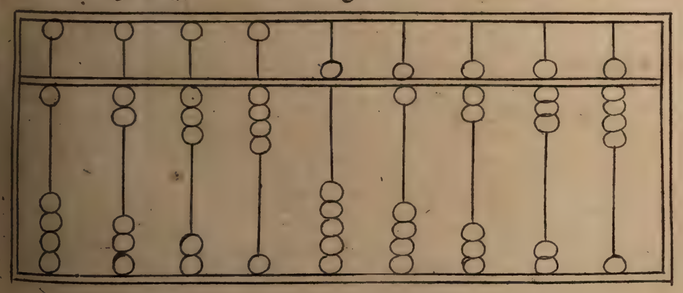


Fig. 1.

The Chinese Abacus from the Chinese Dictionary Conteining 9 places or Degrees.



一 二 三 四 五 六 七 八 九

yĕ lh̀ san sù ỳ lŏ ʂiĕ pă kièu xĕ xĕyĕ xĕ lh́ xĕ sān xĕỳ

I II III IV V VI VII VIII VIIII X XI X II X III XV

lhxĕ lh́ xĕ sānxĕ sān xĕ sú xĕ ỳ xĕ lŏ xĕ ʂie xĕ pă̆c xĕ

XX XX XXX XXX XXXX L LX LXX LXXX

pĕ pĕ lh́ pĕ sān pĕ sù pĕ ʂiēn lh́ ʂiēn sān ʂiēn ván sān ván

100 100 200 300 400 1000 2000 3000 10000 30000

ʂien lŏ pĕ pă xĕ lŏ niên ỳ yuĕ xĕ sān gĕ

CIↃ DC LXXX VI annus V mensis XIII Die

Fig. 1.

nien ỳ giñ ta sien giñ pă chī tam jo vám tien yuén yeú

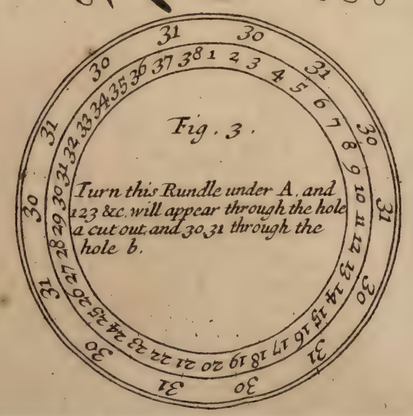


Fig. 3.

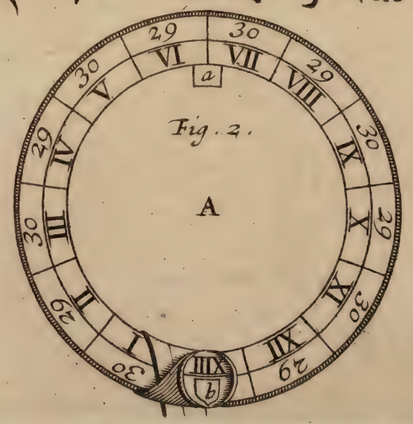


Fig. 2.

I. O. M
DIS. DEABVS QVE
HOSPITALIBVS PE
NATIBVS QOB CON
SERVATAM SALVTEM
SVAM. SVORVM Q
PAEL. MARCIAN
VS PRÆF. COH
ARAM. SAC. F. NC. Ð

Fig. 5.

Fig. 8.

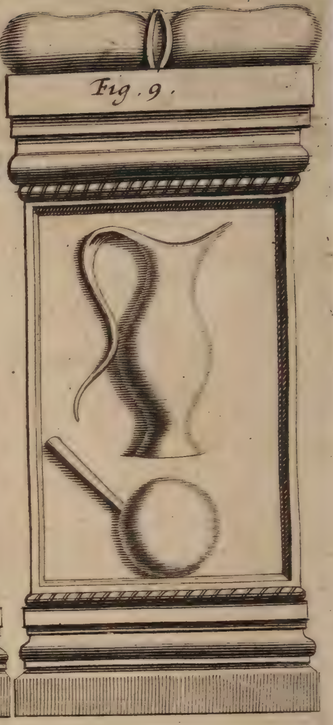


Fig. 9.

Fig. 6.

-AE Y AN
-S Y SEC Y
-ENE M
-I Y ANO
-CONVGI

Fig. 4.

AVE
VIX
ΠΑΛ
ΝΟ
ΠΛΛ

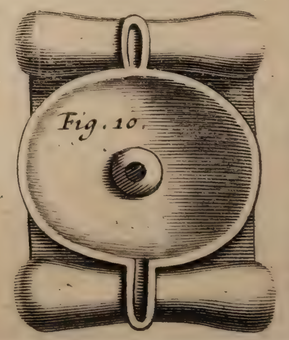
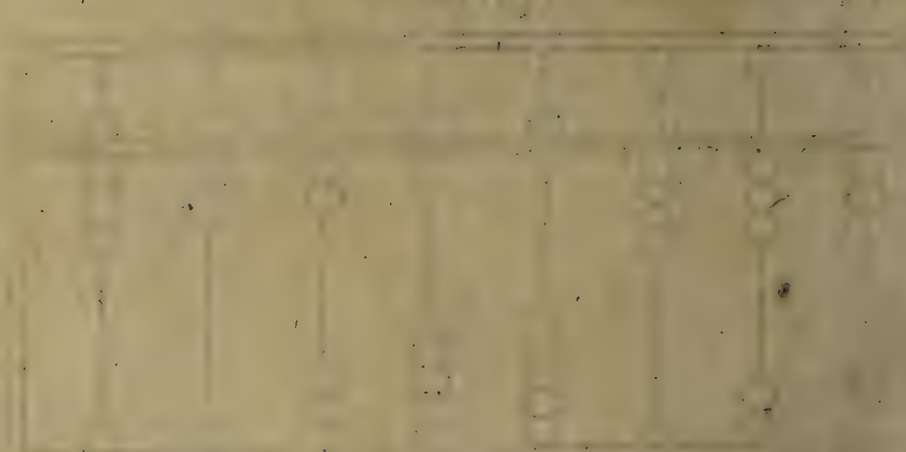


Fig. 10.

Fig. 7.



XXXII. *Jul.* 11. 1685. We *Olivier Eſtienne* an Advocate in Parliament, Subdelegated by Monſeignieur *de Marillac*, Councellor of State in Ordinary, having the Conduct of the Works that are making upon the River of *Eure*, below the Village of *Paſſy*, do Certify that upon the Petition of Meſſire *Robert* Prevoſt of *Cocherel*, Knight and Lord of the Mannor of the Upper and Lower *Cocherel*, We having with us ſeveral Witneſſes, did come to the ſaid Town, and from thence to a Piece of Land call'd *les Hautberges*. Where being come, the ſaid Lord of the Mannor of *Cocherel* did Remonſtrate unto us, that having Occaſion for a conſiderable Quantity of Freeſtone, he had cauſed two Great Stones, which appeared in this Place above Ground only as two Limits or Bounds, the one about a *Foot*, the other about 8 or 9 *Inches*, to be further uncover'd, and That they had been found to be 6 *Foot* High, and about a *Foot* and a *half* Thick; Marked in the Figure of the Sepulcher *A* and *B*; the Breadth of the one marked *A* of 3 *Foot*, and the other marked *B* of 2 *Foot* and a *half*, ſet Endways by one another; and they had further obſerv'd, that it was an *Ancient Sepulcher*, ſhut only on 3 Sides, *viz.* at One End, at the Head, by the two Stones already mention'd, on the Right Side by a Stone placed Edge-ways upon its thickneſs of about 14 *Inches*, and being above 5 *Foot* and a *half* Long, and about 3 *Foot* Broad, touching in a Right Angle. The Stone marked *B* at the Head; and at the Feet another Stone was ſet, marked *D*, of the ſame Thickneſs of the precedent, and about 4 *Foot* Square; all theſe Stones were Cemented together with Mortar made of the Chalk or Marle taken out of the ſame Hole, and mingled with little Stones or Gravel.

The Verbal Proceſs upon the Diſcovery of an Ancient Sepulcher found in France; Communicated by M. Juſtell. n. 185. p. 222.

Fig. 5.

That in this *Sepulcher* were found the Bones of about 20 Bodies of Men, of the *Ordinary Stature*, between 5 *Foot* and a half, and 6 *Foot*, except 2 Youths of about 15 or 16 Years Old; all theſe Bodies lay extended *North* and *South*, the Arms along the Bodies, and the Heads all placed along the two Stones *A*, *B*. In the Right Angle there were 2 Bodies Separated from 2 others by the Stone *E*, of about a *Foot* Thick, 4 *Foot* Broad, and 5 *Foot* and a half Long, that lay in the manner of a *Tomb-ſtone* upon the two Bodies underneath. All theſe Heads had very fair Sound *Teeth* in them, and the *Cranium* and other Bones of the Head, were much Stronger and Thicker than thoſe of ordinary Heads; which argues them to have been of Strong well Conſtitution'd Men; amongſt them all there was not any *Woman's* Head.

In proceeding ſtill to examine the *Sepulcher*, we did obſerve, that at the ſame diſtance from the Superficies of the Earth, and from thoſe Bodies thus Bury'd, there was 3 little *Earthen Pots*, of about 4 *Inches* Diameter, and between 4 and 5 *Inches* High, of a Black Earth as ſoft as Wax; which could not be ſeparated from the other Earth without Breaking them, and the pieces being come into the Open Air turn'd of a Grayiſh Colour and grew Hard: Theſe Pots were full of *Wood Coals* and *Aſhes*, which were not much examin'd.

All theſe Large Stones of the *Sepulcher* were Rough, and had not been Cut, but ſeem'd to have been fetch'd from a Neighbouring *Quarry*, which is about 400 *Foot* off, upon the ſame Hill.

We obſerv'd beſides, that in the place where were laid the two Heads of the Bodies that lay upon the *Tomb-Stone* E, there were found 2 Stones: The one whereof was about 6 *Inches* long, and ſome 15 *Lines* broad in its Broadeſt place, and about 4 *Lines* Thick; fram'd like the Head of a *Pike*, very Sharp and Cutting at both Ends and on the Sides; it was a *Yellow Flint*, of which the beſt Firelock-Stones are made, being almoſt as hard as an *Agat*. The oher Stone, which was likewiſe under one of theſe Heads, was ſhap'd like the Head of an *Axe*, about 4 *Inches* long, and 3 *Inches* booad, having a Hole at the narr weſt end, and about 6 *Lines* thick, very Sharp and of a Greeniſh Stone, ſpotted with white Spots as hard as *Agat*: The *French Lapaidaries* call it *Pierr de Jade*, for the *Nephretick Stone*.

Under the two Heads which were Under the *Tomb-Stone* E, there were alſo found two other Stones; the one much of the ſame Nature with that firſt deſcrib'd, but ſomething longer, and the Sharp end a little Dull'd. The other was likewiſe in the Shape of an Axe Head, very Sharp and Cutting, of about 3 *Inches* long, and 2½ broad, and 6 *Lines* thick, with a Hole in it at the narrow end: The Stone was of a Dark Green Colour, which the *Lapidaries* call, *Oriental Serpentine*.

On the Left ſide of the *Sepulchre* which was Open, there were 16 Bodies in the ſame Situation as the firſt, placed *North* and *South*, their Heads along the great Stone A, and the Arms extended along the Bodies, the Bones all Entire, though they appear'd very Ancient, and after two Days lying in the Air fell all to Duſt.

All the Bones of theſe Heads, as has been ſaid before, were very Thick, there was one that had been Pierced by ſome Blow, and Nature had repaired the Wound; within, the Hole was Round, as having been made by ſome Sharp Round Weapon, which argued likewiſe the Wounded to have been a Soldier. Under every one of theſe Heads, there was a little Stone: Two were Round, one of a Reddiſh Colour, of about an *Inch* Thick, having a Hole at each End, which leſſen'd and grew narrower towards the middle. Another of a Cheſnut Colour and about the bigneſs of a Cheſnut, made in the Shape of a Coat-Button, with a Hole clean through it, but Roughly Poliſh'd and Hard, ſeeming on one ſide to have ſuffer'd by the Fire.

There were likewiſe two other little Stones, which according to probability were under the Heads of the Young Bodies; whereof one was about 2 *Inches* long and 8 *Lines* Broad, and 2 *Lines* thick, pretty Sharp at the broader End, and having a Hole at the narrow End: It is thought to be of the ſame *Pierre de Jade*, Green and White, but 'tis nothing near ſo Hard as the Firſt. The other Stone was about 17 *Lines* long, 8 broad, and 2 *Lines* thick, ſomewhat Sharp at the broad End, and having 2 Holes at the narrow End, the one bigger than the other: 'tis thought to be of a *White Marble* or *Alabaſter*.

There

There were moreover found under these Heads 3 Stones, whereof Two were of a *Gray Pebble*, such as we find by the Sea-side, shaped like *Axes Heads*, Sharp and Polish'd, about 4 or 5 *Inches* long and 4 broad at the Broadest End, about 1 ½ *Inch* at the Narrowest, and in the Middle about an *Inch* Thick. These Stones were by their Narrow End to be put into a piece of *Staggs Horn* fitted to receive them, as appear'd by several pieces found in this *Sepulcher*, which had an Oval Hollow at the end to receive one of these Stones; these pieces were about *6 Inches* long, and had a Hole at the other end by which they might be fasten'd to a Longer Stick. The *3d* Stone was of the Shape of the precedent, but of a *Black Pebble* like a *Flint*, of which this Country is very Full; and it was besides remarked that the pieces of *Staggs Horn* were Worn at the End, and Polished upon some Stone, but not Cut with Iron.

Under all the other Heads there were 10 little Stones like *Black Flint*, one under each Head, cut all in the same Shape, Smooth on one side and Sharp on the other; 'tis thought they might use them as *Knives*.

There was likewise found in the same place under one of the Heads a Stone, which within was of *Black Flint*, having the Outside of a White Substance, as that sort of Stone uses to be; this had two Eminences like Teeth, which we took to be Natural, and not Artificial. All these Stones thus placed under their Heads shewed that they had them in great Esteem.

Amongst these Dead Bodies has been also found some Bones Sharpen'd, to put at the End of a Stick, or at the End of an Arrow; one was of the smaller Bone of a *Horse's Leg*, and the other was made of the Sharp End of the *Andouilleres* of a *Stagg's Horn*.

Amongst all these Stones there has been found no sort of *Inscription*, *Sculpture* or *Character*, either in *Relievo* or otherwise, which might oblige us to think that these Men had any knowledge of *Christianity*; but rather that they had some *Idolatrous Superstition*, as these Stones seemed to Indicate. Wherefore we thought fit to declare to the said Lord of the Mannor of *Cocherel*, that he might without Scruple use these Stones for what he thought fit.

Since the Expedition of the present *Verbal Process*, there having been further Digging on the Left side of this *Sepulcher*, it has been discovered that the bottom of the *Sepulcher* was Raised, and not so deep by a *Foot* and a half as that part where the Bodies were Bury'd. And it is perceivable that in this Place several Bodies have been Burnt, whose *Ashes*, and *Burnt Bones* have been thrown confusedly into this Hole: and 'tis observable, that all along the *Sepulcher*, there is a Vein of *Coals* and *Ashes*, which runs about 2 *Foot* below the Superficies of the Earth, and all these *Ashes* and *Bones* are under this Bed of *Coals* and *Ashes*, which are so Salt and Pungent that they make one Sneeze: and when these *Bones* are Handled they produce a Tingling in one's Fingers Ends, as if one had Handled the Sharpest *Salt-Peter*.

It seems Difficult how to Reconcile the two Ceremonies of *Burying* and *Burning*, except that we should say there has been a Fight in this Place between the *Gauls*,

Gauls and ſome *Barbarous Nation*, who had invaded them; that the *Gauls* have Burnt their Dead, and Sacrificed to the *Manes* of them their Priſoners taken in War, whom they Bury'd with the Ceremonies proper to thoſe *Barbarians*, the Thickneſs of whoſe *Sculls* ſhew that they went Bare-Headed, and their *Arms* ſhew that they had not the Uſe either of *Iron* or *Braſs* to make *Arms* of, but uſed ſuch as Nature afforded firſt, as ſome *Indian Nations* do Now.

The Figures of ſeveral Antiquities; by ..... n. 175. *p.* 1159. Fig. 32, 33, 34, 35, 36, 37, 38, 39.

XXXIII. 1. *Fig.* 32. A *Ring* of *Corinthian Braſs* with a Vizard of *Silenus* in a *Sardonix*.

33. An *Amulet* of the *Gnoſticks* cut in a *Chalcedonian*, the Names of certain *Æones* or Intelligences.

34. A *Teſſera* of Chryſtal, having on one ſide XIIII, on the other I Δ.

35. A *Fortune* and a half *Diana* in an *Onyx*.

36. An Ancient Picture of the *Virgin* in a *Chalcedonian*.

37. A *Cameus*, with a mixture of Several *Gods*.

38. An *Onyx*.

39. A Glaſs *Lachrymatory*.

By ..... n. 176. *p.* 1201. Fig. 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61.

2. *Fig.* 40, 41, 42, 43, 44, 45. Res *Turpiculæ*, or *Priapi*, worn by *Roman Children* againſt *Faſcination*. 46. An *Egyptian* Braſs *Serapis*, or *Teraphim*. 47. A Braſs *Stilus Scriptorius*. 48. 49. Old *Roman Keys* of Braſs; one being a Ring to wear on a Woman's Finger. 50. An Iron *Die*, or *Alea*. 51. A *Flat* Iron *Die*, or *Talus*; upon the narrow Sides are 6. 5. 2. and 1. 52. A *Roman* Iron *Ring*. 53. An Old *Roman* Braſs *Ring*, marked XXXV, for a *Slave* to wear. 54. A Braſs *Roman Ear-Ring*. 55. A Braſs *Lunula*, or *Meniſcus*. 56. A Braſs *Fibula*. 57, 58, 59, 60, 61. Ancient *Paſts*, or Opaque *Enamels* of divers Colours, for *Pavements* taken up at *Baiæ*.

An uncommon Inſcription on a very great Baſis of a Pillar lately dug up at Rome; *by M.* Adrian Auzout. *n.* 183. *p.* 172.

XXXIV. This *Inſcription* was Copy'd from the Stone by M. *Adrian Auzout*, and ſent by him to M. *Juſtel*. It is Threefold upon 3 Sides of the *Baſis*, as follows:

P. SVFENATI. P. F. PAL. MYRONI
EQVITI. ROMANO. DECV
RIALI. SCRIBARVM. AEDILI
VM. CVRVLIVM. LVPERCO. LAVRENTI
LAVINATI. FRETRIACO. NEAPOLI. ANTI
NOITON. ET. EVNOSTIDON. DE
CVRIONI. IIII, VIRO. ALBA
NI. LONGANI. BOVILLEN
SE S. DECVRIONES OB ME
RITA EIVS. L. D. D. D.

P. SVFE-

P. SVFENATI. P. F.
PAL. SEVERO. SEMPRO
NIANO. DECVRIALI
SCRIBARVM. AEDILIVM. CVRV
LIVM. FRETRIACO. NEAPOLI. EV
NOSTIDON. DECVRIONI. ET
SACERDOTI. APOLLI
NIS. ALBANI. LONGA
NI. BOVILLENSES. DE
CVRIONES. OB. MERI
TA. SVFENATIS. HER
METIS. PATRIS. EIVS
L. D. D. D.

P. SVFENATI. P. F.----
MYRONI.
EQVITI. ROMANO. DEC---
ALI. SCRIBARVM. AED---
CVRVLIVM. LVPERCO---
TI. LAVINATI. FRETRIAC---
APOLI. ANTINOITON---
NOSTIDON. DECVR---
IIII. VIRO. ALBANI---
GANI. BOVILLEN---
MVNICIPES. OB.
EIVS. L... D.----

2. Bene noſti *Claſſem Ægyptiacam* ſive *Cataplum Alexandrinum* antequam Portus *Oſtiæ* eſſet exſtructus, ſingulis Annis appuliſſe *Puteolos*, unde demum Frumentum *Romam* deferebatur. Poſtquam vero *Auguſtus*, & *Claudius Cæſares* & poſtea *Nero Oſtiæ* Portum aperuerunt, jam Annona non tantum *Puteolos*, ſed & longe maxima ſui parte *Oſtium* appetebat. Conſtat autem tempore *Tiberii* pulſos *Roma* fuiſſe *Judæos* & *Ægyptios*; unde factum eſt ut ab *Oſtia* per *Agrum Laurentem* deportaretur Frumentum *Ariciam* & *Albam Longam* uſque ad *Bovillas*, ad Decimum nempe ab Urbe Lapidem; neque enim longius progredi permittebatur. A *Bovillis* enim *Romam* per *Inſtitores Romanos* deferebatur. Neque enim *Ægyptiis* aut *Judæis* in Urbe Habitare aut Horrea habere erat licitum. Menſoribus vero & Venditoribus Frumenti *Oſtiæ*, & paſſim alibi, præfuiſſe *Decuriones*, & hoc quoque ex Jure conſtat. Sed vero omnibus iſtis minoribus *Decurionibus*, qui in ſingulis Locis & Urbibus Frumenti Curam haberent, præfuiſſe alium *Decurionem*,

Explain'd by Dr. Voſſius. Ib. P. 174.

rionem, qui vicem *Præfecti Annonæ* obiret, & in omnibus iſtis Inferiorum *Decurionum* Collegiis Primum teneret Locum ; id manifeſte ex hac patet *Inſcriptione*, ubi Minores *Decuriones Bovillani* Honorem faciunt *Equiti Romano* & *Palatino*, qui *Decurio* ſeu *Curialis* & *Fretriacus* in omnibus eſſet Locis & Urbibus, a quibus & per quas Annona *Ægyptiaca Romam* devehebatur. *Decuriones* vero promotos fuiſſe ad Honorem *Sacerdotii*, ita ut ſimul *Flamines*, *Luperci*, *Epulones Jovis*, & *Paraſiti* fierent *Apollinis* ; & hoc quoque multis conſtat Exemplis. Omne vero dubium tollit, quod in hac *Inſcriptione Eques* ille *Romanus* vocetur *Antinoiton* & *Eunoſtidon Decurio*. *Antinoi* enim Urbs præcipua tum temporis *Ægypti Superioris* erat Civitas, unde per multos Foſſas Frumentum deferebatur ad *Mareotin* Lacum, qui ad *Eunoſti* Portum Exit in Mare. Ab hoc Portu dicti *Eunoſtidæ* Curatores Frumenti *Ægyptiaci* ; unde demum Confectus de Dec. *Eunoſtus* Rei Frumentariæ Inſpector, qui huic præſideret Portui.

An Ancient Sepulcher near Rome; by.... n. 185. p. 227.

XXXV. In an Inundation of the *Tiber A.* 1686. the Water having pierced a ſtrong thick Wall which joyn'd to a great Country Palace about 2 *Miles* from *Rome*, and paſſing under the ſame, broke out at a Corner of an *Aqueduct* by the ſaid Houſe, where there was found a Small Vault of an Oval Figure, in which there was a Stone *Sepulcher* pretty Large, with the following *Inſcription* P. M. R. C. *cum Uxore* .... and more which could not be Diſcern'd ; By this ſame there was a great Earthen *Urn* ſhut up very Cloſe, which being Opened, there came out a Strong Smoak, that it made the Man that was by it almoſt Giddy ; the Smell was like *Bitumen*, but being quickly Diſperſed ; they found in the bottom of the ſaid *Urn* an Earthen Pot made up as a *Lamp*, full of a *Materia Oleoſa*, which by degrees as the Cold Air got into it, grew Hard. Several Perſons ſuppoſe this to be one of thoſe *Perpetual Lamps* that the Ancients mention.

An Etruſcan Inſcription ; by Mr. Octavian Pulleyn. n. 228. p. 539. Fig. 62.

XXXVI. I here ſend you an *Inſcription* on an Old *Urn*, in the *Etruſcan* Language ; The Character ſeems to be not much unlike the *Runick*. *Vid. Fig.* 62.

The Catacombs at Rome ; by Mr. J. Monro. n. 265. p. 643.

XXXVII. The *Catacombs* at *Rome*, are a narrow *Gallery* Dug, and carry'd a vaſt way under Ground with an Infinite Number of others going off it on all Hands, and an Infinite Number of little Rooms going off the Principal and them too. Thoſe commonly ſhewed Strangers are thoſe of *San Sebaſtiano*, thoſe of *San Lorenzo*, thoſe of *Sant Agneſe*, and the others in the Fields a little off of *Sant Agneſe*. They take their Names from the Churches in their Neighbourhood, and ſeem to divide the Circumference of the City without the Walls between them, extending their *Galleries* every where under, and a vaſt way from it, ſo that all the Ground under, and for many *Miles* about it is ſaid to be Hollow. I have alſo ſeen thoſe at *Naples* ; and as they ſay, there are *Catacombs* in the Neighbourhood of all the great Towns of that part of *Italy*.

Some

Some Authors will have them made by the *Primitive Chriſtians*; adding, That in the times of *Perſecution*, they Lived, held their Aſſemblies, and laid up the Bodies of their Martyrs and Confeſſors in them. This is the Account that prevails at *Rome*, and conſequent to it there are Men kept conſtantly at Work in them. As ſoon as thoſe Labourers diſcover a *Repoſitory*, with any of the Marks of a *Saint* about it, Intimation is given to the *Cardinal Treaſurer*, who immediately ſends Men of Probity and Reputation to the Place; where they find a Palm Painted or Engraven, or the Cypher X p. which is commonly read *pro Chriſto*, or a Small Round Projection in the ſide of the *Gallery*, a little below the *Repoſitory*, what is within it is carry'd to the Palace. Many of theſe Projections we have ſeen Open, with pieces of the Vials in them; the Glaſs indeed was Tinctured, and 'tis pretended that in theſe Vials was conſerved the Blood of the *Martyrs*, which was thus laid up nigh their Bodies, towards their Head, to diſtinguiſh them from thoſe of the Others that were not call'd to the Honour of laying down their Lives for the Faith of the Goſpel. After the Labourers have Survey'd a *Gallery*, they do up the Entry that leads into it; thus moſt of them are ſhut; nor are more left open than what is neceſſary to keep up the Trade of ſhewing them to Strangers. But to this Opinion it may be juſtly Excepted, that allowing the *Catacombs* to be proper for the End for which they are preſum'd to be made, and that the *Chriſtians* of that Age were in a Capacity of making that Convenience, for themſelves to Live and Aſſemble in Below Ground, at a Time when 'twas ſo very unſafe to Appear Above it; yet to ſuppoſe that a Work of that Vaſtneſs and Importance could be carry'd on without the knowledge of the Government, is to ſuppoſe the Government Aſleep, and that that was actually done under its Noſe, that muſt neceſſarily have Alarm'd it, had it been attempted on the Frontiers of the Empire.

Another ſort of Authors Repreſent them as a Work of that Vaſtneſs, that the *Chriſtians* in the Perſecuting Times had not Number enough to Carry it on; but then moſt unadviſedly confound them with the *Puticuli* in *Feſtus Pompeius*, where at the ſame time that the Ancient *Romans* uſed to *Burn* the Bodies of their *Dead*, the Cuſtom was, to avoid expence, to throw thoſe of the *Slaves* to *Rot*. The *Roman Chriſtians* (ſay they) Obſerving at length the great Veneration that certain Places gain'd by the preſence of *Relicts*, reſolv'd to provide a Stock for themſelves; entering therefore the *Catacombs*, they made in ſome of them what *Cyphers*, what *Inſcriptions*, what *Painting*, they thought fit, and then Shut them up; intending to Open them again upon a Dream or ſome other important Incident. The Few that were in the Secret of this Artifice either Dying, or as the *Monks*, who were the only Men that ſeem to have Heads adapted to a thought of this Quality, were ſubject to many Removes, being Tranſported to other Places, the Contrivance came to be forgot, and thoſe *Galleries* continu'd ſhut, till Chance, the Parent often of great Diſcoveries, Open'd them at laſt. Thus they conclude, the Remains of the Vileſt part of Mankind are Trump'd up in the Church for the Bodies of the moſt Eminent *Confeſſors* and *Martyrs*.

But ſurely either the *Catacombs* are not that great Work they are Repreſented to be, nor to be found every where about the City, or 'twas very Improper in *Feſtus Pompeius* to call them by the little Name of *Puticuli*, and to Confine them to One Place only, that I mean unknown now without the *Eſquilin-Gate*. The True Notion of the *Puticuli* is this, Holes Dug perpendicularly in the Ground to throw Bodies Indifferently and without any Decency in; and this was the Conduct of the Ancient *Romans* with reſpect to their *Slaves*, as Implying Simplicity and the care to avoid a greater Expence. After the ſame manner when the *Perſecutors* ſpilt the Blood of ſo many *Martyrs*, they uſed to dig Holes perpendicularly in the Ground, and to throw the Bodies promiſcuouſly in them: and of this the Memory is ſtill conſerved, Churches being Built in the Places where the Holes were made, and little *Monuments* Erected over the Holes themſelves, to which the Name of *Putei* is continu'd to this Day. But what is all this to the *Catacombs*, where *Repoſitories* are cut, in the Face of a long *Gallery*, one over another, ſometimes to the Number of 7, in which Bodies were ſingly laid, and handſomly done up again, ſo that nothing cou'd offend the View of thoſe that went in, eſpecially with the little Rooms of the faſhion of *Chappels*, that have all the Appearances of being the *Sepulchres* of People of Diſtinction; And if they were kept in better Repair, they would be without diſpute the *Nobleſt Burying-Place* this Day in the World.

As often as they fall under my Conſideration, I cannot forbear thinking they were made for This End by the Ancient *Romans*, and made in conſequence of thoſe two Ancient Opinions, That the *Shadows* Hate the Light, and Love to Hover about the Place where the Bodies are Laid; they appear ſo Eaſy and Decent a reſting place for the one, without the leaſt fear of being ever Diſturbed, and at the ſame time, there is provided a Noble and Vaſt Codvenience full of Variety for the others, to Solace themſelves freely and with pleaſure in.

I think 'twill not be Deny'd, that laying up the Bodies in *Caves* was the Original way of diſpoſing of the *Dead*; this was that of the *Phœnicians*, and as they were the Men that with their Colonies Peopled the *Weſtern Parts* of the World, 'tis more than probable they carry'd it along with them whitherſoever they went. Afterwards as Men grew Great and Powerful, they Erected Noble and Magnificent *Monuments* for themſelves Above Ground; at length others of Inferior Degree imitated them, all leaving Room enough, and Excluding the Light. But then *Interring*, as we do now, in the Open Air, or in Temples, was never the manner till *Chriſtianity* brought it in. Of the whole we have many Inſtances, and *Il Signior Abbate Bencini, Bibliothecary* of the *Propaganda*, a Gentleman of good Ancient Learning, aſſured me in the Converſation I had with him on this Argument, that on the great Roads in moſt parts of *Italy* little *Catacombs* have been and are ſtill found Under Ground, and that 'twas the Cuſtom to build little Houſes over them. And as to the Marks of a *Martyr*, he added that they do not Conclude much; that the ſo fam'd Cypher Xp was in Uſe among the Ancients long before *Chriſtianity* begun, and that it was compoſed of the

two

two *Greek Letters* X P, under which ſomething *Myſtical* was Comprehended, but that he met with no Author that gave Account what the *Myſtery* was.

Thus after a multitude of Thoughts about the *Catacombs*, I am forc'd to take up with this; ſo Natural it is, ariſing from the ſole Theory of the Place, and falls in ſo appoſitely with the Religion and Practice of the Ancients, among whom the *Dii Manes* were the *Tutelary Gods* of the Country, and D M. at the Head of an *Inſcription* argues the *Moles*, the *Sepulcher*, the *Monument*, &c. was in the Primary Intention made for and Dedicated to the *Soul*. Upon the ſame Maxims, in Foreign Expeditions, when a Hero Dy'd or was Kill'd, as the Body was liable to a quick Corruption, and for that Reaſon unfit to be Tranſported entire, they fell on the Expedient of *Burning*, in order to bring home the *Aſhes*, to oblige the *Manes* to follow, that ſo the Country might not be Depriv'd of the Benefit of its *Tutelage*. This I humbly conceive was the Original of *Burning*, which by degrees became more and more Univerſal, till at laſt the *Pomp* and Magnificence of it reconciled it to all that were able to go to the length of the Expence. As for the prejudice of the *Silence* of the *Ancient Authors* in this Matter, 'tis eaſily Remov'd, and to be Regreted at the ſame time that the Authors of all Ages too much neglect the Cuſtoms of their own Time. Writing for the Satisfaction of their Contemporaries, they think it Impertinent to trouble them with the Account of what they ſee tranſacted every Day. By this Means the Ancient Cuſtoms, with the Time and Reaſons of their Diſuſe, are loſt with reſpect to us, and ours with the ſame Circumſtances may come to be ſo with relation to Poſterity.

Upon the whole matter, the *Catacombs*, I humbly conceive, were the *Burying-Places* of the Ancient *Romans*; at Length the manner of *Burning*, which they receiv'd from the *Græcians*, coming by Degrees to Prevail univerſally; they fell under a Total neglect. This is the State in which the *Primitive Chriſtians* muſt be ſuppos'd to have found them. And therefore here they Laid up the Bodies of their Dead: and perhaps when the *Perſecution* was Hot, Conceal'd themſelves and kept little ſeparate Aſſemblies in their Chambers. At laſt the Empire turning *Chriſtians*, they fell again into the old ſtate of Neglect, in which they continu'd till upon the Reading of, I have forgot what Author that makes mention of them, they came to be Look'd into and Search'd.

What I have writ relates to the *Catacombs* of *Rome*, thoſe of *Naples* are a quite other thing.

XXXVIII. I ſet out from *Venice* [in 1675.] with thoſe Gallies which carry'd Their Ambaſſador that went for the *Port*. We touch'd at moſt of the conſiderable Towns of *Iſtria* and *Dalmatia* by the way. In *Iſtria* we ſaw *Pola*, an ancient Republick. There remains yet an *Amphitheater* Entire: It is of Two Orders of *Tuſcan Pillars*, plac'd one over another, and the Lower Pillars ſtand on *Pedeſtals*, which is not Ordinary; for, commonly they have nothing but their *Baſes* to ſupport them. There is, beſides a

Obſervations in a Voyage from Venice to Smyrna; by Mr. Fr. Vernon. n. 124. p. 575.

Temple Dedicated to *Rome* and *Auguſtus*, a *Triumphal Arch*, Built by a Lady of the Family of the *Sergii*, in Honour of ſome of her Kindred, which commanded in thoſe Countries; beſides ſeveral *Inſcriptions* and *Ancient Monuments* which are in divers parts of the Town.

In *Dalmatia* I ſaw *Zahara*, which is now the *Metropolis* of the Country. It was Anciently call'd *Jadera*. It's now very well Fortify'd, being encompaſs'd on 3 Sides with the Sea, and that part which is toward the Land extreamly Advantaged by all the Contrivances of Art, having a *Caſtle* and a *Rampart* of very Lofty *Baſtions* to guard it. I found here ſeveral *Ancient Inſcriptions*. We paſt in Sight of *Zebenico*, and ſaw 3 *Forts*, which belong to the Town, *St. Nicolo*, *St. Gioanni* and *La Fortezza Vecchia*. That which is moſt worth ſeeing in *Dalmatia*, is *Spalatro*; where is *Diocleſian's Palace*, a Vaſt and Stupendous Fabrick, in which he made his Reſidence, when he Retreated from the Empire. It is as Big as the whole Town; for the whole Town is patcht up of its Ruins, and is ſaid by ſome to take its Name from it. The Building is Maſſive; there is within it an Entire Temple of *Jupiter*, Eight-ſquare, with Noble *Porphyry Pillars*, and *Cornice*, worth any Body's Admiration. There is a Court before it, adorn'd with *Ægyptian Pillars* of that Stone call'd *Pyropoicilos*, and a *Temple* under it, now Dedicated to *Sta Lucia*; and up and down the Town ſeveral Fragments of *Antiquity*, with *Inſcriptions* and other things, worth taking notice of.

Four *Miles* from *Spalatro* is *Salona*, which ſhews the Ruins of a Great Town. About as much farther from *Salona* ſtands *Cliſſa* upon a Rocky Hill, an eminent *Fortreſs* of the *Venetians*, which is here the *Frontier* againſt the *Turk*; from whence they Repulſt him in their Late Wars with great Honour. I was at *Leſina*, where is nothing very remarkable, but *Biondi*, that hath written our *Engliſh Hiſtory*, was of it. *Trau* is Ancient, and hath good marks of its being ſo. Here I ſpoke with Dr. *Staſileo*, who put out that *Fragment* of *Petronius Arbiter*; and I ſaw his *Manuſcript*.

I was in the Harbour of *Raguſa*, but not in the *Town*. From hence we paſt the *Gulf* of *Budua*, and ſaw the Mountains of *Antivari*, the Plain of *Durazzo* and *Appollonia*, and came to *Saſſino* a Small Iſland, from whence we could ſee the Town of *Valona*, and the Mountains *Acroceraunii*, which are very near, and are now call'd Mountains of *Chimæra*.

I ſtayed a fortnight in *Corfu*, and had time to view the Gardens of *Alcinous*, that is, the Place where they are ſuppos'd to have been, now call'd *Chryſida*, a moſt Delicious Scituation; The Ancient Port, now call'd Νεκυομαντεῖον; and ſeveral Foundations of Ancient Fabricks. In *Zante* I ſaw but little of *Antiquity*: What is *Modern* is very Flouriſhing, and the Iſland Rich and Plentifull.

I went from *Zante* to *Patras*, a Town in *Achaia*, of good Note among the Ancients. Near it is a great Mountain, mention'd by *Homer* by the Name of *Petra Olenia*. In the Town are ſeveral Maſſive *Ruins*, which few there know how to give an Account of. There are the *Remains* of a Large Church, Dedicated to St. *Andrea*, who, they ſay, was *Martyr'd* there. This is the firſt Town I ſaw on the Continent of *Greece*.

The

The Plain about it is very Fruitful, full of Springs and Rivolets; finely Wooded with *Olive* Trees, *Cypresses*, *Orange* and *Lemon* Trees. The *Citrons* here are counted amongst the Best of the *Turkish* Empire, and are sent for Presents to *Constantinople*. So are all their Fruits in very good Esteem.

In *Athens* I have Spent 2 Months. Next to *Rome* I judge it the most worthy to be seen for *Antiquities* of any I have yet been at. The *Temple* of *Minerva* is as Entire as the *Rotunda*. I was 3 times in it, and took all the Dimensions, with what exactness I could; but it is Difficult, because the *Castle* of *Athens*, in which it stands, is a Garrison, and the *Turks* are Jealous, and Brutishly Barbarous, if they take notice that any Measures it. The *Length* of the *Cella*, or *Body* of the *Temple*, without-side is 168 } *Feet* { These Measures you may rely on as Exact the Breadth — 71 } *English* { to $\frac{1}{2}$ a *Foot*.

The *Portico* of the *Dorique Order*, which Runs Round it, hath 8 *Pillars* in Front, 17 on the Sides; the *Length* of the *Portico* is 230 *Feet English*. the *Fuste* or *Shaft* of the *Pillars* is $19\frac{1}{2}$ *Feet* in Circumference: The *Intercolumnium*, $1\frac{1}{4}$ of the *Diameter* of the Pillars.

The *Temple* of *Theseus* is likewise Entire, but 'tis much Less, though Built after the same Model. The *Length* of its *Cella* is but 73 *Feet*, the *Breadth* 26. The whole *Length* of the *Portico*, which goes Round it, 123 *Feet*. 'Tis a *Dorique* Building as is that of *Minerva*. Both of them are of *White Marble*.

About the *Cornice*, on the Outside of the *Temple* of *Minerva*, is a *Basso Relievo* of Men on Horse-back, others in Chariots; and a whole Procession of People going to a Sacrifice. of very Curious *Sculpture*. On the Front is the History of the *Birth* of *Minerva*.

In the *Temple* of *Theseus*, on the Front within-side the *Portico*, at the West-end, is the *Battel* of the *Centaurs*; and at the East-end, seems to be a Continuation of that History. But there are several *Figures* of Women, which seem to be *Pirithous's Bride*, and those other Ladies which were at the *Wedding*. On the Out side the *Portico*, in the Spaces between the *Triglyphi*, are several of the Prowesses of *Theseus*, most in *Wrestling* with several Persons, in which he Excell'd: All his Postures and Looks are Expresst with Great Art. Others are *Monsters*, which he is made Encountring with, as the *Bull* of *Marathon*, the *Bear* of *Calydon*, &c.

There is a *Temple* of *Hercules*, a Round Fabrick, only of 6 *Feet* Diameter, but Neat Architecture. The *Pillars* are of the *Corinthian Order*, which support an *Architrave* and *Frise*, wherein are done in *Relievo* the *Labours* of *Hercules*. The Top is but One Stone, wrought like a Shield, with a Flower on the Out-side, which rises like a *Plume* of *Feathers*.

There is yet Standing the *Tower* of *Andronicus Cirrhestes*, which is an *Octagone* with the *Figures* of 8 *Winds*, which are Large, and of good Workmanship; and the *Names* of the *Winds* remain Legible in fair *Greek* Characters, (where a House which is built against it on one Side, does not hinder;) as ἀπηλιώτης, ἄνεμος, βορέας, σκείρων, ζέφυρος. Each *Wind* placed against its

Quarter

Quarter in the Heavens; and the Roof is made of little Planks of *Marble*, Broad at Bottom, and which meet all in a Point at Top, and make an Obtuſe *Pyramid* of ſome 32 or 36 Sides. There is a Delicate *Temple* of the *Ionique Order* in the Caſtle, whether of *Pandroſos*, or whom, I cannot tell; but the Work was moſt Fine, and all the Ornaments moſt Accurately Engraven.

The *Length* of this *Temple* was 67 } *Feet*.
The Breadth —— —— —— 38 }

The *Pillars* which remain of a *Portico* of the Emperor *Adrian*, are very Stately and Noble: They are of the *Corinthian Order*, and above 52 *Feet* in *Height*, and 19½ in *Circumference*: They are *Cannellate*; and there are now Standing 17 of them, with part of their *Cornice* on the Top. The Building, to which they belong'd, I Meaſur'd the *Area* of, as near as I could conjecture; and found it near a 1000 *Feet* in *Length*, and about 680 in *Breadth*.

Without the Town, the *Bridge* over the *Eliſſus* hath 3 *Arches* of Solid Stone-work: the middlemoſt is near 20 *Feet* Broad. There is the *Stadium* yet to be ſeen, whoſe *Length* I Meaſured, and found it 630 *Feet*, near to what the Preciſe Meaſure of a *Stadium* ought to be, *viz.* 625.

Towards the Southern Wall of the *Caſtle* there are the Remains of the *Theater* of *Bacchus*, with the *Portico* of *Eumenes*, which is near it; the Semidiameter, which is the Right Sign of the Semicircle which makes the *Theater*, is about 150 *Feet*. The whole Body of the *Scene*, 256. M. *de la Guilliotiere* in that Book he hath written of *Athens*, hath made a Cut of a *Theater*, which he calls that of *Bacchus*, which is a meer Fancy and Invention of his own, nothing like the Natural one, which, by the Plan he has drawn of the Town, I judge he did not Know.

Thebes is a large Town, but I found few *Antiquities* in it, excepting ſome *Inſcriptions* and *Fragments* of the *Old Wall*, and one *Gate*, which they ſay, was left by *Alexander*, when he Demoliſht the reſt. It is about 50 *Miles* Diſtant from *Athens* as I judge.

Corinth is two Days Journey Diſtant: the *Caſtle*, or Ἀκροκόρινθος is Standing, which is very Large. The Main of the Town is Demoliſht, and the Houſes, which now remain, are ſcatter'd, and a great Diſtance from one another. So is *Argos*, which to go Round would be ſome 4 or 5 *Miles*, as the Houſes now ſtand; but if they ſtood together, they would ſcarce exceed a good Village. *Napolo della Rumilia* is a Large Town, and full of Inhabitants, and the *Baſha* of the *Morea* reſides there: It is but a very few Leagues diſtant from *Argos*.

Sparta is quite forſaken; and *Meſtra* is the Town which is Inhabited, 4 *Miles* diſtant from it. But one ſees great *Ruins* thereabout; almoſt all the *Walls*, ſeveral *Towers* and Foundations of *Temples* with *Pillars* and *Chapiters* demoliſht: A *Theater* pretty Entire. It might have been Anciently ſome 5 *Miles* in Compaſs; and about a *quarter* of a *Mile* diſtant from the River *Eurotus*. The Plain of *Sparta* and of *Laconia* is very Fruitful, and Long, and well Watered. It will be about 80 *Miles* in Length, as I judge.

The

The Mountains on the Weſt ſide of it, very High, the Higheſt I have yet ſeen in *Greece*; the *Maniotes* Inhabit them. But the Plain of *Calamatta*, which anciently was that of *Meſſine*, ſeems rather Richer.

Corone is very abundant in *Olives*. *Navarrino*, which is eſteem'd the Ancient *Pylos*, hath a very Strong *Caſtle*, Fortify'd by the *Turks*, and is the Beſt *Port* in all the *Morea*. *Alpheus* is much the Beſt *River*, and the Deepeſt, and with great reaſon extoll'd by all the Ancient Poets, and choſen for the Seat of the *Olympick Games*; for it's very Pleaſant. The Plains of *Elis* are very Goodly and Large, fit to breath Horſes in, and for Hunting; but not ſo Fruitful as thoſe of *Argos* and *Meſſene*, which are all Riches. The beſt Woods I ſaw in *Peloponneſus* are thoſe of *Achaia*, abounding with *Pines* and *Wild Pear*, the *Ilex* and *Eſculus-Trees*, and, where there runs Water, with *Plane-Trees*.

Arcadia is a very Goodly Champaign, and full of Cattel, but is all encompaſſed with Hills, which are very Rough and Unhewen. *Lepanto* is very pleaſantly Seated on the Gulf, which runs up as far as *Corinth*; and without the Town is one of the fineſt Fountains I ſaw in *Greece*, very Rich in Veins of Water, and Shaded with Huge *Plane-trees*; not Inferior in anything to the Spring of *Caſtalia* on Mount *Parnaſſus*, which runs through *Delphos*, except in this, that one was Choſen by the *Muſes*, and the other not; and Poetical Fancies have given Immortality to the one, and never Mention'd the other.

Delphos it ſelf is very Strangely Scituated on a Rugged Hill, to which you have an Aſcent of ſome 2 or 3 *Leagues*; and yet that is not a quarter of the way to come to the *Pique* of *Parnaſſus*, on the ſide of which Hill it ſtands. It ſeems very Barren to the Eye; but the Fruits are very Good, where there are any. The Wines are Excellent, and the Plants and Simples, which are found there, very Fragrant and of great Efficacy.

About *Lebadia*, and all through *Bœotia*, the Plains are very Fertile, and make amends for the Barrenneſs of the Hills which encompaſs them: But in Winter they are apt to be Overflown for that Reaſon, and to be turn'd into Lakes; which renders the *Bœotian* Air very Thick, and ſo were their Sculls too, if the Ancients may be believ'd concerning them; though *Pindar*, who was one that Sublimated *Poetry* to the Higheſt Exaltation, and is much Fancy'd and Imitated in our Age, as he was much Admired in his Own, was Born there; And *Amphion*, who was ſaid to be ſo Divine in his *Muſick*, that he Raviſh'd the very Stones, had Skill enough to entice them to make up the Walls of *Thebes*. So that not every thing that's Born in a Dull Air, is Dull. Theſe Vales I found much Planted with *Cotton*, and *Seſamum*, and *Cummin*, of which they make great Profit and a great Trade at *Thebes* and *Lebadia*.

I went from *Thebes* into the Iſland of *Eubœa*, or *Negropont*, and ſaw the *Euripus*, which Ebbs and Flows much after the Nature of our *Tides*; only the *Moon*, and ſometimes *Winds*, make it Irregular. The Channel which runs between the Town, and a Caſtle, which ſtands in an Iſland over againſt it, is ſome 50 *Feet* Broad; and there are 3 *Mills* on it, which ſhew all the Changes and Varieties that happen in the *Current*. Near the *Euri-*

Vid. *Vol.* II. *Cap.* II. *Sect.* VIII.

pus

pus and oppoſite to the Town, they ſhew a *Port*, which they ſay was *Aulis*, and it is not Improbable, for it muſt be thereabouts. Between *Negropont* and *Athens* is a High Hill, call'd Αγιομαυρε, formerly very Dangerous, but now Guarded by *Albaneſes*: It is part of Mount *Parnaſſe*; and near it on the Left Hand lies Mount *Pentelicus*, from whence the *Athenians* Anciently fetch'd their Stone, and now there is a Convent of *Calloieri*'s there, one of the Richeſt of all *Greece*.

In going from *Athens* by Sea, I Embarqued in a Port, which lies juſt by *Munichia*: That which they call *Porto Pyræo* lies behind it, a Mile diſtant, which is a Large Port, able to contain 500 Veſſels. There are the Ruins of the Town yet remaining, and of the *Walls*, which joyn'd it to the City of *Athens*. I Sailed by *Porto Phalero*, the Ancient Haven of *Athens*, which is rather a Road than a Port. I ſaw an Iſland call'd Φλέβεσ, where the *Athenians* had Anciently *Mines*. I went aſhore on the Promontory of *Sunium* to view the *Remains* of the *Temple* of *Minerva*, which ſtood on it. Hence I Sailed among the Iſles of the *Archipelago*, *Macroneſia*, *Thermea*, *Serphanto*, *Siphanto*, till I came to *Melo*. From *Melo* I Sailed through the *Cyclades* to come to *Smyrna*. I paſt by *Andros*, *Tenos*, *Mycone*, *Delos*; *Naxia* and *Paros* I ſaw at a Diſtance. We Sail'd near the Northern Cape of *Sio*, and the Southern of *Mytelene* or *Lesbos*, and ſo came into the Gulf of *Smyrna*. Within this Gulf ſtands *Burla* near ſome ſmall Iſlands, which is judg'd to be the ancient *Clazomenæ*; *Foja* which is the ſame with the ancient *Phocæa*: Near this the River *Hermus* diſcharges it ſelf into this Gulf.

A Voyage from England to Conſtantinople; by Dr. Tho. Smith. n. 230. p. 527.

XXXIX. *Aug.* 3. 1668. We went on Board the *Bezant* Yacht for the *Downs*. where we arriv'd the next Day in the Afternoon, and went on Board the *Leopard* Frigat, Capt. *O-Bryen* Commander, appointed to carry Sir *Daniel Harvey*, his Majeſty's Ambaſſador, to the *Port* of the *Ottoman Emperor* at *Conſtantinople*.

Aug. 9. We Sailed from the *Downs*, but were forc'd to an Anchor S. W. of the *South Foreland*: We carry'd a *Flag* upon our *Main-Top* after we came out of the *Downs*.

15. The Wind in the Afternoon at N. E. brought us by 7 of the Clock to the *Neſs*.

16. We were in the Morning athwart St. *Hellen's Point* in the Iſle of *Wight*.

17. In the Morning we got to the Weſt of *Portland*; but about Noon, Sailing over part of the *Race* of *Portland*, where we met with a Tumbling Sea, we Anchor'd at N. W. part in the *Bay*, over againſt the Point that looks towards *Weymouth*. We went aſhore in the *Iſland*, which ſeems tobe but one continu'd *Rock*; the *Soil* in ſeveral places not being above 5 or 6 *Inches* Deep, as I found by digging a Hole with my Knife: yet the Corn Flouriſhing enough. The *Caſtle* conſiſts of a Double Fortification; we could not obſerve above 5 *Guns* Mounted. They told us, that in the *Iſland* there was but one *Church* and 4 Villages. We weighed at 12 of the Clock at Night: But 18. The Wind blowing fiercely at W. we could not Weather

ther the *Start Point* that Night. The Moon upon its first Emerging above the Horizon, seem'd to have a Colour like Burnt Brick, the Sky very Cloudy: but some Rain falling, as she advanc'd Higher and Higher, she appear'd more and more Fiery.

19. We Weathered the *Start Point* by Noon: And the 29*th* we got into *Plymouth Sound*. The *Citadel* is built upon a Rock, with large *Counterscarps* and *Bastions*.

23. We Weighed out of *Plymouth Sound*, and made the *Lizard*, a Promontory in *Cornwall* before Night: The *Manacles*, several Rocks so call'd, we discern'd very distinctly, it being then Low-Ebb, as also the *Lands-End*. The Wind blew fresh; and we observ'd the Waves in the Night time, as if they had been Liquid Fire, but Palish.

25. We were full Open with the *Bay* of *Biscay*. Several *Gulls* were hovering over the Surface of the Water to Catch Fish, which Swam by in vast Shoals, at above 50 *Leagues* distance from any Land. At other times I have seen several *Birds* Floating upon the Water, which being driven by some Tempest from the Coasts of *Spain* and *Portugal*, have been Tired in their Flight, and so Drown'd. This happens frequently in the *Great Ocean*, where they meet with no Land to Fly to in several *Hundred Leagues*: and sometimes even in the *Mediterranean*, in the Mid-Seas between the *Christian* and *Barbary-Shores*. In blowing Weather, among other *Birds* flying cross, we saw a *Hawk* making to our Ship, then under good and swift Sail, which perch'd upon the *Round-Top* of the *Main-Mast*; which one of the Seamen espying, he presently run up the Shrouds, and brought down the *Hawk*, which made no attempt to fly away, being quite Spent.

27. We found our selves by our *Observations*, in the *Lat.* of 42 *Deg.* 17 *Min.* the Weather being Excessive Hot.

28. Dreadful Lightnings in the Clouds towards the Evening; after which great Dews fell; the Weather Extream Hot.

30. This Morning we were surpriz'd to see our selves within 4 or 5 *Leagues* of the Shore, when we thought that we had been above 20. In the Afternoon we Weathered the Westermost Isle of the *Burlings*: On the greatest of which, being as we gues's'd, above *half* a *Mile* in Length, the *Portuguese* have built a *Fort*, to hinder the *Barbary* Pirates from Careening their Ships there, or taking in Fresh Water. The Land of it very High. By it lie several Rocks. The other Islands are Distant about a *League*. I told 5 of them: the Greatest of which last lye somewhat inward to the Shore. For 2 Nights together about this time (28. and 29.) the Sky being very Hazy, the Sun Set in a Colour as *Deep* as *Blood*, which was very astonishing. We were then in the *Lat.* of 40 *Deg.*

31. Betimes in the Morning we Sailed by the *Rock* of *Lisbon*.

Sept. 1. In the Morning we made *Cape St. Vincent*. All along the Coasts, at the Distance of about 2 or 3 *Leagues*, are several *Watch-Towers* built to give notice of *Pyrates*.

5. In the Morning we Weathered the Point of *Cadiz*, and came to an Anchor in the Bay of *Bulls*, about *half* a *League* from the great *Porgos*; and

in the Afternoon went on Shore. We were entertain'd by the *Engliſh Conſal*, and carry'd by him to view the *Fortifications*, which are eſteem'd to be as Regular as any in *Chriſtendom*; built in the ſame place where the Town had been attack'd formerly by the *Engliſh* under the Conduct of the Earl of *Eſſex* in the Reign of Queen *Elizabeth*. *Plays* are uſually Here, as in other Parts of *Spain*, Acted on a *Sunday*.

9. We Sailed from *Cadiz*.

10. This Afternoon we were forc'd to Anchor, not far from Cape *Spartel* or *Sprat*, as the Seamen call it, not being able to Weather the Point.

11. This Day we came to an Anchor in *Tangier-Bay*.

Tangier lies within the Entrance into the *Strait* of the *Mediterranean*, in the *Latitude* of about 35 *Deg.* 36 *Min.* It is Situated in the Bottom of a Bay, and is built on the Side of a Hill, overlooking the Sea, encompaſſed with High *Walls* to the Land-ward, and commanded by a Strong *Caſtle*. The Heats would be very Troubleſome but for the *Sea-breezes* which Cool and Fan the Air. In the *Caſtle* I met with a *Roman Monument*, erect'd to the Honour of *P. Beſius*, a great Officer and Soldier in *Trajan*'s Time, who among his other Titles, is there Styl'd, PRO. FIG. MAURITANIAE TINGITANIAE. [which ſince has been taken away, and Preſented to the Univerſity of *Oxon* by Sir *Hugh Cholmondley*] The *Engliſh* have 2 *Churches* here, (though they only make uſe of One, the other being reſerv'd againſt all Accidents) both of them very neat and convenient; though not to be compar'd with the *Church* of the *Portugueſe*, Retain'd ſtill, (according to the Articles of Agreement when the King of *Portugal* made over the Right and Title and gave the Poſſeſſion of *Tangier* to the Crown of *England*,) by *Canons Regulars*, belonging to it, which is very Stately and Adorn'd with Rich *Images*, and Supported by *Marble Pillars*. Toward one end of the *Engliſh Church*, juſt by the *Veſtiary*, which had been formerly a *Turkiſh Moſch*, and afterwards the *Chappel* of a Convent of *Dominicans*, is a *Monumental Stone-Table*, with *Arabick* Characters, containing an Account of the Houſes, Lands, and other Revenues, belonging to it, ſet up in the 743 Year of the *Hegira*, that is of *Chriſt*, 1341. The *Mole* is in good forwardneſs; they having gain'd above 200 Yards in the Sea, in order to the making a Good and Safe Harbour for Ships to Ride in, which lie open to Wind and Waves; the outward ſide to the Sea-ward ſomewhat Sloping. *Old Tangier* lies at ſome little Diſtance, where they find very frequently, in Digging, ſeveral pieces of *Roman Coin*.

13. We Weigh'd out of *Tangier* and Turn'd into the *Strait*, though againſt the Wind. The Diſtance between *Gibraltar*, (which gives Name to the *Straits*, and is joyn'd to the Continent of *Spain* by a narrow *Iſthmus*,) and *Seuta*, (a well-built and ſtrongly Fortify'd Town, lying under the Hill *Alybe*, call'd ſo by the *Greeks*, which the Seamen commonly call, as do ſome *Spaniſh* Writers, *Apes-Hill*, from the great Number of *Apes* which uſed formerly to Haunt there (at which places *Hercules* is feign'd to have ſet up his *Pillars*) may be about 6 *Leagues*: though both Lands lying very High (for we ſaw the Clouds much below them) it does not

appear

appear in the Middle of the Current, out of a Tall Ship, ſcarce half ſo Broad.

15. A great Miſt all the Sea over, ſo that we could ſcarce ſee three Lengths of the Ship, which began to vaniſh in the Afternoon; and then we deſcry'd the *Cape of Malaga* at about 4 *Leagues* diſtance; and came to an Anchor that Night. The *City* lies under a High Hill, and is the Seat of a Biſhop, who is at this time a Natural Son of King *Philip* the *4th*, of the Order of *St. Dominic*. Here the Merchants told us, that it had not *Rain'd* for 7 *Months* together, except a Day or two for an Hour: And that the *Algerines*, who were then Breaking with us, had not been able to have ſet a Fleet to Sea, if they had not been furniſh'd with *Maſts* from *England*. I only make a Query, Whether *Jews* or *Engliſh Men* were the Fraighters.

16. The next Morning we Weigh'd from *Malaga* Road, the Weather very Hot. In the Evening the Sea being quiet, we ſaw a great Number of *Tortoiſes* Swimming above Water, ſeveral *Bottle-Noſes*, Fiſh of about 3 *Yards* Long and very Thick, and *Hawks* Flying over to the *Barbary* Coaſt. The *Hills* of *Granada* were ſeen plainly by us, though at a great Diſtance.

21. We paſſed by *Cape de Gata*: but the *Levant Wind* ſtill blowing, having continu'd almoſt in that Point for above 2 *Months*, as we computed from what they told us at *Tangier*, we could make but little Progreſs in our Voyage.

25. Between 3 and 4 of the Clock in the Morning the *Tornado's* began to Blow, and the Wind Violent for the time, with ſuch continu'd Flaſhes of *Lightning* for ſeveral Hours, as that the whole Sky ſeem'd to be on Fire, intermix'd with Terrible Claps of *Thunder*, after which follow'd great Showers of *Rain*.

28. We were athwart *Orlando's Gap*, within 2 Leagues of the Shore: The Wind now ſtill; but a Swelling Sea coming from the Weſtward: which is Uſual before a Wind, which drives the Water before it. On *Michaelmaſs Day* we were up with the Iſland *Ivica* or *Iviſe*, as the Mariners call it. The next Day at Noon we made the Iſland *Majorca*, ſituate over againſt the Kingdom of *Valentia*, and came to an Anchor in the *Bay* of the City. In the Afternoon the Boat was ſent on Shore; but the *Vice-Roy* would not give us a *Prattick*, not bringing a Patent from *Malaga*.

Oct. 1. The Secretary was ſent with the King's Paſs to the *Vice-Roy* to demand *Prattick*, who preſently Summon'd the Officers of the *Sanità*. After long Debates and Delays they Conſented, and came to the *Mole* to receive him, He went directly to the Governour to acquaint him, that we were ready to *Salute* the City with what Number of *Guns* he pleaſed, if he would engage upon his Honour to give us as many. He Reply'd, that he would give us 3 for 5; and wonder'd that we being but a Single Ship, ſhould make ſuch a Demand. The Secretary told him, That we were to be Treated as an *Admiral*, having a *Flag* on our *Main-Top*; and that the Governour of *Malaga* had done it. To this he ſaid, that *Majorca* was a Kingdom, and that he was the King's Repreſentative, and that by Reaſon

of the Miſcarriage of his Predeceſſor, when Monſ. *de Beaufort*, the *French Admiral*, was there, he had receiv'd ſtrict Orders from *Madrid* not to do the like. The Secretary reply'd, That we had an Ambaſſador on Board, and had as ſtrict Orders, and ſhould anſwer as ſeverely for the Breach of them. His laſt Anſwer was, That we might, with our *Sails Looſe*, keep before the Town, till we had furniſh'd our ſelves with what we wanted. Upon receiving this Meſſage, the *Ambaſſador* diſpatch'd away one *Joſeph Gabriel Cortez*, a *Spaniard*, but employ'd by the *Engliſh* Merchants Trading to that Iſland, then on Board our Ship, to acquaint him, That when we were Ready to go away, we would *Looſe* our *Sails*, and not before. We Landed within the *Mole*; the Walk upon it is about 4 or 5 *Yards* Broad; at the Extremity of which is a very Large and Stately Gate which Leads into the City. We went into the *Great Church*, ſomewhat Wider than *Weſtminſter-Abbey*, but Darkiſh within: The Portal very Magnificent, Adorn'd with ſeveral *Marble Statues* in *Niches* one over another. The *High Altar* very Plain and Unadorn'd: but others extraordinary Rich and Glorious. Not far from the City are ſeveral Mills to Grind their *Olives*, *Oyl* being the great Commodity of the Iſland.

2. The next Morning we Weighed, without taking any kind of Notice of the Town, Sailing all along in Sight of the Iſland, which preſented us with a Pleaſant and Delightful Proſpect; the Valleys, lying under the Hills, Fruitful of Wine and Corn. The whole Iſland is judg'd to be about 60 *Leagues* in Compaſs, and in Length about 15. To the S. S. E. lie ſeveral little Iſlands, call'd the *Cabreras*; between which and *Majorca* we Steer'd.

3. We were athwart *Port Maon* in *Minorca*; a Fine Level Country, having but one Hill in it.

5. We deſcry'd the Main-Land of *Provence*.

6. We were over againſt the Iſlands *Hieres*, and the Highland of *Thouton*.

9. We were over againſt the Weſtermoſt part of the *Alps*, which we diſtinctly ſaw at about 20 *Leagues* Diſtance, and appear'd far Higher than the *Hills* of *Granada*.

12. We came in the Morning to an Anchor over againſt the *Mole*, and not far from the *Lantern* in *Genua*. Having obtain'd *Prattick* of the *Maeſtri della Sanità*, after a little Demur about the *Salute*, the Senate being aſſembled, and ſome of them Proteſting upon their Honours, and ready to produce their Regiſters, that they never *Saluted* the Ship wherein was an *Ambaſſador* of *France* or *Spain*, as not taking any notice of the Perſon, who did bear that Character, till they had firſt Intimation that the Ship was arriv'd in their Port by its *Saluting* the Town, It was agreed that the Ship ſhould *Salute* the Town with 11 *Guns*, which they were to *Anſwer*, as they did, with an equal Number: and after a little Pauſe they *Saluted* the *Ambaſſador* with 19 more, which was *Anſwer'd* with as many. After this, the *Duke* and *Senate* ſent the Maſter of the Ceremonies to wait upon the *Ambaſſador*: who going away, return'd ſoon after with a Preſent of *Calves*,

Fowl,

Fowl, *Wine*, *Sweet-meats*, &c. and acquainted his Lordſhip, that they had Deputed 6 of their Gentlemen to Complement him, and wait upon him; which Civility he thought fit to Refuſe, deſiring to be *Incognito*. But however going a-ſhore, he was welcom'd by the *Illuſtriſſimi Signori*, the *Durazo's*, two Brothers, the Elder of which had been *Ambaſſador* for the *Republick*, in the Court of *England*, and the other at *Conſtantinople*, and by them carry'd to ſee the *Villas* out of Town. The Figure of *Genua* is Semicircular, beginning from the *Lantern* Weſtward, lying under an High Hill, upon the Riſing of which the ſeveral Houſes, built of *Marble*, afford a very Fine Proſpect, and Add much to the Beauty and Glory of the Place. *Strada Nuova* perchance is the moſt ſtately Street in the whole World. The *New Church* of the *Anunciata*, built by the *Lomellini* for Curious *Painting*, Rich *Altars*, and Exactneſs of *Architecture* is incomparable. The *Steps* which lead up to it, are ſo Many and of ſo Large a Compaſs, being Semicircular, that they may Contain about 1000 upon them at the ſame Time. The *Duome* alſo and the *Church* of the *Theatines* are very Stately and Curious.

14. In the Evening we ſet Sail from *Genua*.

18. In the Afternoon we made the Iſland *Gorgonia*, about 9 *Leagues* from *Livorne*, a little Round Iſland, with a Caſtle on the Top.

19. In the Morning we came to Anchor in *Livorne Road*, about a *Mile* from the Town. The *Road* is Large and Secure, eſpecially to the Northward. The *Ambaſſador* keept on Board, the Governor Refuſing to *Salute* the Ship firſt, though he had formerly *Saluted* the *French*; Pretending, that every Convoy might carry a *Flag*; and alledging that his Maſter, the *Grand Duke*, was as Great and Abſolute, as the *Republick* of *Genua*, and that they had rather throw themſelves upon the King of *England*, than do a thing which might prove of ſuch an ill Conſequence. Sir *John Finch*, his Majeſty's *Reſident*, together with Sir *Thomas Baines*, came from *Florence* to Complement the *Ambaſſador*, and immediately Diſpatch'd away a Courier to the *Grand Duke* about the *Salute*; who refer'd the whole Affair to the Governour: and he making a Proteſt that he was ready to pay all the Reſpect which was due to the *Ambaſſador*'s Character and Quality, upon the forementiond Pretenſions, Six Days after our Arrival, abſolutely refuſed to *Salute* the Ship *Firſt*.

Livorne is the great Magazine of Trade for the *Levant*, being a *Free-Port*: Merchants of all Countries Reſiding here, *Armenians* eſpecially, and *Jews*, which latter enjoy great Privileges, without wearing any *Diſtinct Mark* in their Hats, or Habits, whereby they may be known. They are allow'd the Publick Exerciſe of their Religion: Their Synagogue Large and Handſome. The *Port* inward has a *Mole* for the *Duke's Galleys* and other ſmall Veſſels to Ride in: the entrance of which is Chain'd up every Night. Hard by is the *Statue* of Duke *Ferdinand* in *Marble*, raiſed upon an High *Pedeſtal*; under which are four Slaves in *Braſs*, in different Poſtures, very Large, and above the Ordinary Proportion, but done with Exquiſite and Admirable Art. Two *Caſtles* to Seaward well Fortify'd: the

the Town *Walls* very High, and the 4 *Gates* Strongly Guarded: below which is a *Ditch* of about 15, or 20 *Yards* over, and very Deep. No Stranger is allow'd to view the *Works*, nor Soldier permitted to come out of the *Caſtles*. About 4000 *Slaves* are there, as the Merchants told us, who are lockt up in the *Bagno* every Night. The *Piazza*, where the Merchants Meet, is Adorn'd with *Marble Pillars*, which ſuſtain the *Portico's*: at the Eaſt End of which is the *Great Church*, whoſe Roof appears very Glorious, having ſeveral Circles Richly *Gilded* and *Painted* with Curious *Figures*. The Broad Street is Paved between 2 and 3 *Yards* on each ſide with *Free-ſtone*.

27. In the Afternoon we Weighed out of *Livorne-Road*.

29. We were forc'd back by Contrary Winds.

30, We Weighed a 2d Time.

Nov. 5. At Evening we ſaw the *Eruptions* of *Fire* from *Stromboli*, which lies to the North-Weſt of *Sicily*. Sometimes it Flam'd very *Bright* as a Beacon, at other times there appear'd only a Glowing kind of *Light*, like that of an ordinary Star when the Air is Thick and Hazy. They ſay that it *Flames* moſt in Rainy Weather,

6. In the Morning we were up within a *League* of it, and plainly perceiv'd it to *Smoke*. It is of a Round Figure, and as we gather'd, may be about 3 or 4 *Miles* in Compaſs. Not far from it lye ſcatter'd ſeveral other Iſlands, call'd by the Ancients *Æoliæ* and *Vulcaniæ*: among which are *Lipara*, a long Flattiſh Iſland, and *Vulcannello*, which *Smokes* moſt. This Afternoon we came to an Anchor in 8 Fathom Water in the *Phare* of *Meſſina*, in the Mid-Stream between *Scylla* and *Charibdis*: a Violent Current Setting againſt us, and the Wind not High enough, ſo as to be able to Stemm it. The Breadth of the Strait from *Meſſina* to *Rhegium* may be about a *League*. The Land is very High on the *Calabrian* ſide, where are very Steep Rocks, and great Depth of Water, above 150 *Fathom*, as they told us: but on the *Sicilian* ſide, near the *Charibdis* Shole Water, and uſually an Eddy. On the Sandy Banks ſtands the *Phare* or *Watch-Tower*. Several *Currents* meeting in this narrow Paſſage, cauſe a great *Ripling*; and the Waters are ſometimes carry'd N. and ſometimes S. the great danger is leſt the *Current* drive the Ship on either Side. We have had no *Lightning* for 7 or 8 Nights together.

7. We Sailed by *Ætna*, now call'd *Mongibel*, where the Sea Widens 10 or 11 *Leagues* over. Now we ſee plainly the *Smoak* briskly iſſuing out of the *Crater*, the *Limbus* of which was all Black. The uppermoſt part of the Mountain was covered with *Snow*, except ſome ſtreaks of *Aſhes*, as we judge, which lies as it were in a Gutter, ſpread here and there.

13. We were up with Cape *Modona*, the Southermoſt Cape of the *Morea* and ſail'd by *Coron*. The Land very High, the Hills of *Arcadia* lying Eaſtward from us. The Weather *Exceſſive* Hot at this time, as it is in *England* at *Midſummer*.

4. In

14. In the Evening we ſail'd between the Iſland of *Cerigo* and the *Main-Land* of *Greece*; it being about 3 *Leagues* over to *Cape Angelo*.

15. We entered the *Arches*, and ſteered through the *North-Channel*, leaving *Melo* and *Antimelo* on the Starboard Quarter, at ſome *Leagues* diſtance.

16. Betimes in the Morning we were athwart *Negropont*, and ſail'd between it and *Andros*. The *Bocca* lyes S. W. and N. E.

17. We ſailed by *Chios*, or *Scio*, which is very Mountainous towards the middle. It is about 4. *Leagues* diſtant from Cape *Caraboroun*, or the *Cape* of the *Black Noſe*, as the *Turkiſh* VVord ſignifies, which the Seamen in their uſual way of corrupting Names, call Cape *Jobbernoule*, the *Corinæum* of the Ancients, a Promontory of the famous Mountain *Mimas*, which runs along the Southern ſide of the *Bay* of *Smyrna*.

18. We got into the Bay of *Smyrna* and came to an Anchor without the *Caſtle*, not far from St. *Jacomo's Point*, as the Seamen call it, or rather *Sangiac Point*. In the Evening we heard a great Howling of *Jackalls* upon the Hills.

20. The *Conſul* with the *Nation*, accompanied with his *Drugger-Men* and *Janizaries* in their Habit, together with ſeveral *French*, *Dutch* and *Geneeſe* Merchants, reſiding in that famous *Emporium*, came to the Village near the *Caſtle*, who there expected us with Horſes. Upon our going aſhoar, the *Leopard* fired 51 Guns. We made about 140 Horſe; and immediately upon our ſetting forth, we rode for about 3 *Miles* together under the Hill to the S. VV. of *Smyrna*; the Places adjoyning ſet thick with *Olive*, *Fig*, and *Almond*-Trees. Afterwards we Clammered over ſome Rocky Aſcents; but the Horſes of the Country being ſure-footed we were in no danger of falling. Some little way we were forced to ride on the Sea-ſhore, and ſoon after came to the *Jews Burying-place*, whoſe *Monuments* ly flat upon the Ground. As ſoon as we entered into the City, we found the Streets full of *Greeks*, *Armenians*, *Turks* and *Jews*, whom Cutioſity had drawn together to ſee and obſerve our *Cavalcade*; the *Engliſh* Ships, which were in the *Bay*, Firing their Guns as we paſt near the Shore. And after 3 *Hours* Riding the *Ambaſſador* was brought to the *Conſul's* Houſe, where Lodgings were provided for him.

Dec. 8. VVe took our Leave of *Smyrna*, being accompanied by the *Conſul* and Merchants on Board the *London-Merchant*, Capt. *John Hill* Commander, the *Leopard* being ordered to go no further than *Smyrna*, it being feared in *England*, that if ſhe had Sail'd up to *Conſtantinople*, the *Turks* might have Preſt her for their Service in *Candia*, which they were then Beſieging.

20. We ſail'd between *Scio* and *Mitylene*.

21. We paſt by *Lemons*, and were up with the Iſland *Tenedos*; a fine Champaign Country, only with One Hill toward the Middle of it. The *Caſtle* to the N. E. part of the Iſle: over againſt which lye 3 ſmall Iſlands in a ſtraight Line. Here we came to an Anchor. We ſaw the Ruins of *Troas* at a Diſtance.

22. We

22. We entered the *Helleſpont*, which may be about 2 *Leagues* and a *half* over. The *Caſtles* built upon the oppoſite points of Land, about 11 or 12 *Years* before, after the great Defeat given the *Turkiſh Armata* at the *Dardanels* by the *Venetians*; Cape *Janizary* on the *Aſian* ſide; which, with the *Philæum*, makes a tolerable good *Bay* for ordinary Veſſels. The *Narroweſt-Strait* of the *Helleſpont* is at the two other *Caſtles*, diſtant about 6 *Leagues*, where it may be about $\frac{1}{4}$ of a *Mile* Wide. Theſe the *Chriſtians* call the *Dardanelli*; at which are ſituate the Towns, *Seſtus* and *Abydus* famous in *Greek Poeſie*. Theſe *Caſtles* we *Saluted* with our Guns and Trumpets, as we did the Firſt: but each, whether out of Pride, or out of Covetouſneſs to ſave the *Grand Signior*'s Powder, return'd us no more than 2 *Guns*. The Wind blowing very Fair, we Sail'd into the *Propontis*.

23. We paſſed by St. *Stephanos Point*, where we had a full view of the S. E. Angle of *Conſtantinople*, which being ſituated upon ſeveral Hills to a Mighty Advantage, what with the *Cypreſs*-Trees Intermixed, and what with the *Gilded Spires* of the *Moſchs*, yielded us a very Diverting and Glorious Proſpect. Paſſing by the *Seraglio Point*, which we *Saluted* by a Diſcharge of ſeveral *Guns*, in the Mid-Stream between it and *Tophana*, we came to Anchor.

26. On St. *Stephen*'s day the *Ambaſſador* Landed at *Gallata*, (having before been Viſited by the Earl of *Winchelſea*, and the Merchants Reſiding there) and was received there by the *Chiaus Baſhi* and the *Vaivod* of *Galata*, the *Janizaries* and *Chiauſes* attending, and was waited upon by them to his Palace. And ſoon after the *Kaimacam*, or Governor of *Conſtantinople*, ſent an Officer to Complement him upon his Arrival; the *Grand Signior* being then at *Lariſſa* in *Theſſaly*.

Jan, 2. The *Ambaſſadors* Old and New, went over to *Conſtantinople*, that Morning being aſſign'd by the *Kaimacam* to give them Audience; the *Chiaus Baſhi* and other Officers attending at the Water-ſide to receive them, Horſes being brought thither for them and their Followers to mount. This *Kaimacam Juſuph*, a little Old Man, had formerly been a Page of the Chamber, aud chief Falconer, and afterward *Baſha* of *Siliſtria*. He entertain'd the *Ambaſſadors* and their Company with Perfumes, Coffee, and Sherbet, and diſtributed about 15 *Koftans*, or Veſts, among them: after about an Hour's ſtay they took their Leave.

Being upon the Coaſts of *Greece* about *Aug.* or *Sept.* 1671. in the *Lat.* of 35 *d.* 33 *m.* we found by our *Azimath-Compaſs*, that we had *Weſterly Variation* there 5 *d.* 22 *m.*

The *Variety* of *Colours* of the *Sea-Water* at ſeveral times chiefly Depends upon the Wind and Weather, and the Reflection of Light upon it. Its uſual and moſt natural Colour is a *Deep Green*, but in Cloudy and Rainy Weather, the Surface of the Water appears *Blackiſh*. Sometimes the Water is of a perfect *Azure-Colour*, as we have obſerv'd for ſeveral Weeks in the *Mediterranean*. The Sun Shining bright upon the Water, ſometimes the upper part of the Wave appears *Purpliſh*, ſometimes *Reddiſh*; though in Shallows perchance it may receive this latter Tincture alſo from the Sands

which

which lie under it. When the Wind has Freſhen'd, and the Ship has been under Full Sail, I have obſerv'd the Waves, at the Head and at the Sides of the Ship, to appear with a *Pale kind of Brightneſs*; which I Aſcribe rather to the *Saline* Particles of the *Sea-Water*, which were then put into a violent Agitation, than to the *Spawn of Fiſh*, as ſome of our Company Imagin'd.

Sailing toward the Weſt of *Portland*, we ſaw ſeveral *Porpiſces* Playing with their Heads above Water; which I mention only, becauſe the Seamen look upon them as fore-runners of a Storm; the Wind ſoon after Blowing very Hard at N. by E. and afterwards arriving at *Conſtantinople*, the Wind blowing a Stiff Gale at North, I obſerv'd, with a pleaſant kind of aſtoniſhment, good part of the *Propontis*, that is from *Seraglio Point* toward the Iſlands, which lie againſt the *Bay* of *Nicomedia*, Eaſtward and South-Eaſt from us, as far as we could ſee, cover'd as it were with *Porpiſces*, which appear'd every where in great abundance. So that I am very apt to believe that *Julius Solinus* is to be underſtood of *Porpiſces*, and not of *Dolphins*, now properly ſo call'd, though that be his Word, ſpeaking of the *Boſphorus* and *Propontis*: *Hæc profunda* Delphinas *Plurimos habent*: and ſoon after, *ante omnia nihil Velocius habent Maria, ſic ut plerumque tranſvolent Vela Navium.* And I could not hear that any *Dolphins* are caught in thoſe Seas by the *Greeks*, whoſe Poverty, added to the Love which their Nation has for *Fiſh*, and the advantage ariſing thence, upon the Account of their ſolemn *Faſts* and *Abſtinences* from all *Fleſh*, even to a wonderful Strictneſs and Scrupuloſity, has made them excellent Fiſhermen.

Poly Hiſtor. Cap. 12.

2. *Conſtantinople*, formerly *Byzantium*, was by *Conſtantine* the *Great* call'd ſo after his own Name, who being mightily pleaſed with the Beautiful and Advantagious Situation of the Place, between two Seas, and defended by narrow Straits on both ſides, Remov'd the *Seat* of the *Empire* hither, and laid the Foundation of its Future Splendor and Greatneſs. It was alſo by a ſpecial *Edict*, or Law, of the ſame Emperor, which he cauſed to be Engraven on a *Marble Pillar*, placed near his own Statue on Horſe-back, in one of the Piazza's of his New Built City call'd *Strategium*, where the Soldiers uſed to Muſter, as in the *Campus Martius*, call'd *Second* or *New Rome*, in emulation of *Old Rome*, which he deſign'd and endeavour'd this ſhould equal in all things. Accordingly he Endow'd it with the ſame *Priviledges* and *Immunities*, and eſtabliſh'd the ſame Number of *Magiſtrates* and Orders of People, and Divided the whole Extent of it into 14 *Precincts* or *Regions* according to the Diviſion of *Rome*. And the *Greek* Writers were as Elegant and Extravagant in their Commendations of it; but the uſual Title in their Ordinary Diſcourſes and Writings, when they had occaſion to mention it without any Flouriſh was ἡ βασιλέυσα or ἡ βασιλὶς, that is, the *Imperial City* to the ſame Senſe with that of *Sidonius Apollinaris*,

Hiſtorical Obſervations relating to Conſtantinople; *by Dr.* Tho. Smith. n. 152. p. 335.

Euſeb. *de Vita* Conſtantini.

Socrat.

In Panegyr.

Salve Sceptrorum Columen, Regina Orientis
Orbis Roma tui.

The Country about it was afterwards call'd *Romania* in a Limited and Reſtrained Senſe, (for that *Romania* was Anciently the ſame with *Orbis Romanus*, ſeems clear from *Epiphanius*) and the People Ρωμαῖοι. But I ſuppoſe this was not done till about the Middle Times of the Empire, when it began to Decline. The *Greeks* ſtill retain the Name: For if you ask any of the *Greeks* born upon the Continent of *Thrace*, what Country-Man he is? he anſwers forthwith Ρωμαῖος *Romios*: for ſo they Pronounce it. The *Turks* in like manner call a *Greek-Chriſtian*, *Urum Gacur*, or the *Roman* Infidel, as they will call ſometimes the *Emperor* of *Germany*, *Urumler Padiſha*, or the *Emperor* of the *Romans*. Hence it was that the latter *Grecian* Emperors Styl'd themſelves Βασιλεῖς Ρωμαίων, Kings of the *Romans*, that is, ſuch as were born in *Romania*, and the other Countries, which made up the *Eaſtern Diviſion* of the *Empire*. Tho' perchance by this Flouriſhing Title they pretended a Right to the Government of the *Weſt*: Upon which Vain Preſumption they aſſum'd alſo the Title of Κοσμοκράτορες, or *Emperors of the World*, as if they had been the True Succeſſors of *Auguſtus*, and the *Weſtern Emperors* Uſurpers, whom they call'd by way of Contempt and Indignation, Ρῆγες, *Reges*, as *Luitprandus* informs us, in the Account of his Embaſſy to *Nicephorus Phocas*, and afforded the People of *Italy* no other Title than that of *Longobards*, or *Lombards*. The *Preſent Greeks* call all the *Weſtern* Chriſtians Λατῖνοι or Φράγγοι *Latines* or *Franks*; the *Turks* only make uſe of the latter, when they ſpeak civilly of us, and calling *Chriſtendom Phrenkiſtan*, in the *Preſent Greek* Φραγγία. The *Turks* now as proudly call *Conſtantinople Alempena*, or the Refuge of the World: where indeed ſeems to be a Medley of all or moſt Nations of 3 Parts of it, and of all Religions; which are allow'd to be publickly Profeſt and Exerciſed every where throughout the Empire, except the *Perſian*. Fot they look upon it as a Corruption of, and Deviation from, the Rules and Doctrine of *Mahomet*, their Great Falſe Prophet: and therefore abſolutly forbid it as Repugnant to, and Deſtructive of the Doctrine of Life and Salvation, as they ſpeak. And accordingly they Condemn with all Imaginable Fury the Profeſſors of it, who pretend to follow *Ali*, as *Sectaries* and *Apoſtates*, and entertain worſe Opinions of them than of *Chriſtians* or *Jews*, or *Infidels*. The *Perſians* are not behind hand with them in their Hatred and Diſreſpect, Deriding them as Groſs and Stupid, and looking upon them as little leſs than Barbarous; Intereſt and Zeal for their ſeveral Tenets heightning their Differences ſo much, that in time of War they Deſtroy one another's *Moſchs*. I remember that there was a great Diſcourſe in *Conſtantinople* among the *Turks* concerning an Impudent Hot-headed *Perſian*, who Publickly in the *New Moſch* Built by the *Mother* of the Preſent *Emperor*, aſſerted, That *Ali* was Equal to *Mahomet*. But it ſeems he very luckily made his eſcape out of their Hands, at which the Prieſts and the more Zealous *Turks* were very much Scandaliz'd.

Hæreſi 69. Sect.

The *Greeks* have 26 *Churches* within the Walls of the City, beſides 6 in *Galata*, of which I have given an Account elſewhere. They have alſo 2 *Churches* at *Scutari*, 1 at *Kadikui*, or *Chalcedon*. So at *Stauroſis*, *Chingilkui*,

gilkui, and ſeveral other Villages upon the *Aſian* Shore of the *Boſphorus*, as at *Beskictaſh*, *Ortakui*, *Chorouch Cheſme*, which *Church* is Dedicated to St. *Michael the Arch-angel*, *Jenikui* or *Neochorion*, *Therapia*, *Bujukdere*, and other Villages on the *European* ſide. They have alſo a *Church* at *Haskui*, where is their *Burying-place*, and another near the *Bagno*, Dedicated to Saint *Paraſceve*. And at *Tatoula* about a *Mile* from *Pera*, upon a Hill, which from the Name of the *Church* is thence call'd by the *Greeks* and *Franks*, St. *Demetrius his Hill*. Next to the *Holy Virgin*, St. *Demetrius* and St. *George* have moſt *Churches* Dedicated to them.

The *Armenians* have not, if I remember aright, above 7 *Churches*; they being few in Number in Compariſon of the *Greeks*.

The *Jews* may have in the City and Places adjacent between 20 and 30 *Synagogues*, this being the greateſt Shelter of that Accurſed and Contemptible People in the *Grand Signior*'s Dominions, next to *Caire* and *Saloniki*: and I believe there may be about 20 or 30000 Families of them. They are of great Uſe and Service to the *Turks*, upon Account of their Brocage and Merchandize, and Induſtry in ſeveral Mechanical Trades. All theſe I look upon as Natives, or Slaves rather, each paying Mony for his Head every Year. Theſe *Jews* indeed very wiſely Collect this Tax among themſelves, and according to an Agreement made with the *Teſterdar*, or *Treaſurer*, pay a certain Sum in groſs for their whole Nation reſiding there: by which piece of Cunning they are great Gainers, and ſpare the Poor among them, leſs able to pay, by a Contribution of the Rich to make up the Sum. The *Engliſh* and *Dutch Ambaſſadors* have their *Chappels* In their Palaces common to their Reſpective Nations.

The *Churches* and *Chappels* of the *Weſtern Chriſtians* of the *Roman Communion* in *Galatia*, are,

St. *Peter's*, belonging to the *Dominicans*, where is the Famous Piece of *Madonna di Conſtantinopoli* as the *Italians* call it, or of the *Bleſſed Virgin*, holding the *Holy Child Jeſus* in her Arms: which they pretend to be drawn by the Hand of St. *Luke*, Celebrated by ſome of the latter *Eccleſiaſtical* Writers to have been a Famous Painter. Out of Reſpect to this Idle Tradition, the Credulous and Superſtitious *Latines* and *Greeks* of the *Roman Communion* ſhew great Veneration to it, which otherwiſe hath little in it of Proportion, Art, or Beauty, to derive any Reputation upon the Deſigner, or upon his Work.

St. *Francis*, belonging to the *Conventual*, Fryars of the Order of St. *Francis*: the Ground of this, by the Wiſe Conduct aud Interceſſion of Cavalier *Molino*, the *Venetian Bailo*, after the Surrendry of *Candia* upon the Peace made by the *Republick* with the *Grand Signor*, was procured to be Reſtor'd, and a Handſome *Church* Re-built with the Large Contributions of Mony ſent out of *Chriſtendom*.

St. *Benedict*, belonging to the *Jeſuits*, where is a Rich Altar curiouſly adorn'd with ſeveral Figures in *Moſaick*. This *Convent* was purchas'd for them by their great Benefactor, *Henry the 4th* of *France*,

St. *Mary*, belonging to the *Observantines*, or *Zoccollanti*, a Branch of the *Order* of St. *Francis*, so call'd from their going in *Zoccoli* or *Wooden Cloggs*.

The *Capucines* have a little *Chappel* Dedicated to St. *George*, hard by the *Fr. Ambassador's* Palace.

St. *Ann*, a *Chappel* frequented by the *Perots*.

St. *Paul* and St. *Anthony*, were both taken away some Years since from the *Christians*, and Turn'd into *Moschs*. The former of which is now known by the Name of *Arab Giamesi*, or the *Mosch* of the *Arabians*. Our Interpreters mention'd also to me the *Church* of St. *John*, which the *Turks* have Seiz'd upon for their Use; St. *George*, which the *Jews* are possest of; and St. *Sebastian*, which was used to be visited chiefly on *Holy-Days*.

The North Wind blows for the Most Part at *Constantinople*, which must be ascrib'd to its nearness to the *Exuine Sea*, which bears that Point from it. So that for want of Southwardly Wind Ships have been forc'd to lie a Month or Two sometimes near the Mouth of the *Hellespont*. This was taken Notice of long since by *Enuapius* in the Life of *Ædesius*, who ascribes the seldom Blowing of the South Wind to the Situation of the Mountains: whereas it is Check'd and Overpower'd by the Exuberance of the Vapours continually sent forth from the *Black* and *Great Sea*, as the *Greeks* call it in Comparison of the *Mediterranean*.

Codini de Orig. Constantinop.

The *Hellespont* is about 40 *Miles* in Length, and at the *Castles* of *Sestos* and *Abydos* the Streight may be about 3 Quarters of an *English Mile* over, or less.

The Length of the *Propontis* is about 150 *Miles*; both Shores may be seen in the Middle of it. In it are,

Cyzicus, an Island near the *Asian* Shore, to which it is Joyn'd by two Bridges. It still retains its Ancient Name Κυζικὸς, and is the Seat of a Bishop; being inhabited by a considerable Number of *Greeks*.

Proconnesus, not far from the former; now, as for some Centuries past, call'd *Marmora*, from the excellent Quarries of *Marble* there found, the *Marmor Cyzicenicum* also being Famous in the time of *Pliny*.

Besbycus, now call'd by the *Greeks* Καλόλιμνο, or the *Good Haven*, not far from the entrance into the Bay of *Montanea*, to the N. b. E. The *Turks* call it *Imramle*.

There are several Islands over against the Bay of *Nicomedia*, formerly call'd *Sinus Astacenus*, according to *Strabo*, about 6 or 7 *Leagues* from *Constantinople*.

Prote, so call'd because they approach first to it, coming from *Constantinople*; to the South of this *Prencipe* and *Pytis*, which I take to be the same with *Pyrgos*, that lies Inmost toward the *Bay*; *Chalcitis*, in Modern *Greek*, *Chalce* or *Chalcis*; *Oxia* and *Platy*, to the North West.

The *Seraglio*, is at the Extream Point of the North-East Angle of *Constantinople*, where formerly stood *Old Byzantium*, within which toward the Haven is a stately *Kiosk* or Summer-House, from whence the *Grand Signior* usually takes Barge, when he passes into *Asia*, or Diverts himself upon

the

the *Bosphorus*, at which time the *Bostangi Bashi*, who hath the Principal Care of the Emperor's Palace, and hath the Command of the *Bosphorus*, sits at the Helm and steers.

The 7 *Towers* are the South-East Extremity.

The only *Suburbs* are to the North-West, along the Haven side; for above the Hill, where the 3 Walls begin, lies an open Champaigne Country, except that here and there, at considerable Distances, Farm-Houses are scatter'd.

The *Haven* runs in from the West, and so opens East.

At the East-End of *Galata* is *Tophana* where they Cast their Great Guns.

Pera and *Galata* have about 6 Gates to the Sea-ward. The whole Tract of Ground was anciently, before the Times of the Emperor *Valentinian*, who enclos'd and fortify'd *Galata* with Walls and Towers, styl'd Περαῖα or *Regio Peræa*, being πέραν τῆς πόλεως, on the other side of the City towards the North, which is the reason of its Name, seated on Higher Hills, and whose Ascent is more Steep and Difficult.

Our *Modern Geographers*, such as *Mercator* and *Ortelius*, who herein follow *Ptolemy*, place *Constantinople* in the *Lat.* of 43 *Deg.* and 5 *Min.* the *Arabian* and *Persian Astronomers*, as *Abulfeda*, *Nassir Eddin*, *Ulugh Beigh*, and so the πρόχειροι κανόνες of *Chrysococcus*, Translated out of the *Persian Tables*, place it more Northerly in 45° but by latter and better Observation it is found, that they have Erred in assigning the *Lat.* of this City, as of several other Places. To salve these Differences, there is no Just Ground of Pretence to say, that the *Poles* are Moveable and have Chang'd their Situation since their Time, whereas it may better be Imputed to their want of due Care, or to their taking things upon Trust, from the Reports of Travellers and Seamen, not having been upon the Places themselves: which is certainly to be said for *Ptolemy*, whose Observations, as to Places more Remote from *Alexandria*, are far from being Accurate and True. The Learned Mr. *John Greaves*, took the *Height* of the *Pole* at *Constantinople* with a Brass *Sextant* of above 4 *Feet* Radius, and found it to be but 41 *Deg.* 6 *Min.* But by the Observation we made in our Court-yard at *Pera* with a very good *Quadrant*, we found it but 40 *Deg.* and 58 *m.*

Vid. *Vol.* I. *Cap.* VII. *Sect.* XXV.

There is no Space between the *Propontis* and the Walls of the City, except just at the *Seraglio-point*, which may be 200 *paces* in Length; where they have Raised on a Platform a Battery for great Guns: but from the *Point* to the End of the *Haven* West, the Space to the Gates is Unequal; in some places about 20 *paces* Broad, in others 3 or 4 times as many more.

The Distance between *Constantinople* and *Chalcedon*, upon the Opposite *Bithynian* Shore, may be about 3 or 4 *Miles*.

In the Walls are Engraven the *Names* of several *Emperors*, who Reign'd about the Declension of the *Græcian Empire*, as *Theophilus*. *Michael*, *Basilius*, *Constantinus Porphyrogenitus*, by whose Care, and at whose Expence, the Several Breaches, caus'd in them by Sea or by Earthquakes, were Repair'd.

Kumkapi

Kumkapi, or the *Sand-Gate* lies toward the *Propontis*: this the *Greeks* call in their Vulgar Language Κονδοσκάλι, *Contoſcalium*, or the *Little Scale* or *Landing-place*. Here formerly was an *Arſenal* for Gallies, and other Small Veſſels; it being a convenient Paſſage over-Sea. Over this *Gate* was anciently Engraven a Curious *Inſcription* ſtill preſerv'd in that excellent Collection Publiſhed by *Gruterus*.

Jedicula Kapi, or the *Gate* of the *7 Towers*, ſo call'd from its nearneſs to that *Acropolis*, is that, I gueſs, which the *Greeks* formerly call'd χρυσῆ or the *Golden Gate*, and by ſome late *Latin* Writers *Chryſea*; in *Luitprandus*, *Carea*, by a Miſtake either of the Tranſcriber or Printer, for *Aurea*; for ſo certainly it muſt be Mended. Over this *Gate* was this *Inſcription*,

Hæc loca Theodoſius *Decorat poſt fata Tyranni,*
Aurea Secla gerit, qui Portam conſtruit Auro.

cited by *Sirmond* in his Notes upon *Sidonius*. This *Gate* is in the *12th Region*, and was alſo call'd ὠρεῖα, from it's beautifull and Curious Structure.

The *Gun-Gate*, formerly call'd *Roman-Gate*, not becauſe it leads towards the *Continent* of *Romania* or *Thrace*, but from St. *Romanus*, where the laſt *Chriſtian Emperor* was Kill'd at the aſſault, which the *Turks* made to force their way into the City by it.

Near *Adrianople-Gate*, is a Fair Large *Moſch* call'd *Ali-Baſſa*, upon a Hill accounted the higheſt in the City.

The Diſtance between Tower and Tower in the Upper Wall to the Landward may be about 90 of my Paces; the ſpace between that and the Second Wall about 18 Paces over.

The Palace where the *Lions*, *Leopards*, and ſuch like Wild Creatures are kept, (where I ſaw alſo ſeveral *Jackals*, was formerly, as the *Greeks* told me, a *Chriſtian Church* Dedicated to Παναγία or the *Bleſſed Virgin*, where this Verſe is ſtill Legible.

Κατὰ Σκυθῶν ἐπνίσας θερμὸν ἐν μάχαις.

Their is no *Tide*, or running back of the Water on any ſide of the *Boſphorus* into the *Black-Sea*, as ſome have imagin'd, whoſe Miſtake might poſſibly ariſe hence, that the Wind being at North, and Blowing Hard, the *Current* ſets more Violently at ſuch times againſt the ſeveral Head Lands, jetting out into the Channel, which admits of ſeveral Turnings, and ſo the Waters are forc'd back to ſome little diſtance: or elſe becauſe when the South Wind freſhens and grows Boiſterous, it makes a High Rolling Sea in *Propontis* and *Boſphorus*, and being contrary to the *Current*, gives a Check to it, ſo that it becomes Leſs Senſible, and is eaſily Stemmed. Where it is Narroweſt the Diſtance ſeems to the Eye to be ſcarce a *Mile* over from one Shore to another; where Broadeſt, not much above a *Mile* and a *half*, unleſs

leſs where it Runs into the Deep Bays, which by reaſon of their Shallowneſs only Harbour Boats.

The *Channel* certainly is *Natural* and not Cut by Art as ſome have Idly Fancy'd, not conſidering how the *Euxine Sea* ſhould diſcharge it ſelf otherwiſe of thoſe great quantities of Waters, pour'd into it by the *Iſter* and *Tanais*, now call'd *Don*, and the other Rivers, whereby it becomes leſs Salt, even very Senſibly to the Taſte, than ſeveral Parts of the *Mediterranean*.

The *Fiſh*, by a ſtrange kind of Inſtinct, paſs in Vaſt Shoals twice a Year, Autumn and Spring, through the *Boſphorus*, that is, out of one Sea into Another; of which the *Greeks*, who Live ſeveral Months of the Year upon them, take great Numbers, and ſupply the Markets at eaſy Rates; the *Cormorants* and other Ravenous Water-fowl, which the *Turks* will not ſuffer to be Deſtroyed or otherways Moleſted, Preying alſo upon them.

The *Weather* in ſome Months is very Inconſtant, Great *Heats* and *Colds* happening the ſame Day upon the Change of the Wind.

The *Winters* at *Conſtantinople* are ſometimes Extraordinary Severe. I have heard it related by ſeveral *Old Greeks*, as a thing moſt certain, that the *Boſphorus* was *Frozen* over in the time of *Achmed*, and that a Hare was Courſed over it. It happened thus, that upon a *Thaw* Huge Cakes of Ice came floating down the *Danube* into the *Black-Sea*, and were driven by the *Current* into the *Boſphorus*, where upon the Return of the *Froſt*, they were Fixed ſo Hard that it became Paſſable. In the Year 1669. there was *Ice* in the *Haven* to the great Amazement of the *Turks*; and ſome were ſo Frighted at this Unuſual Accident, that they lookt upon it as a Diſmal Prodigy, and Concluded that the World would be at an End that Year.

The *Aguglia*, or *Obelisk* in the *Hippodrome* is betwixt 50 and 60 *Foot* High.

The *Hiſtorical Pillar* in *Baſſo Relievo*, rais'd in Honour of the Emperors *Arcadius* and *Honorius*, may be in Height about 147 *Feet*.

Alexius Comnenus lies Bury'd in the *Patriarchal Church* againſt the Wall, and his Daughter *Anna Comnena*, the Hiſtorian, who Liv'd about the Year of *Chriſt* 1117. They pretend to ſhew there the *Reliques* of St. *Anaſtaſia*, who ſuffer'd *Martyrdom* under the Emperor *Valerianus*, and of St. *Euphemia*, *Virgin* and *Martyr*, who loſt her Life moſt Glorioufly for *Chriſt*'s Holy Religion at *Chalcedon* under *Diocleſian*.

In *Sancta Sophia* there are *Pillars* ſo Great, that a Man can ſcarce Fathom them at *Twice*. At the End of the *Gallery*, that joyns the other Two, each about 30 of my Paces wide, there is a piece of *Tranſparent Marble*, Two or Three *Inches* Thick. In the North *Gallery* upon the Pavement is a *Reddiſh* ſort of *Marble* Stone, brought, as the *Turks* and *Chriſtians* relate, from *Paleſtine*, on which they Fable, that the *Bleſſed Virgin* uſed to Waſh the Linnen of our *Saviour*.

I obſerved but One Step from the *Body* of the *Church* to the *Bema*, or Place where the *Altar* formerly ſtood.

The

The great *Mosch* at *Chasim-Bassa* on *Pera* side to the West was formerly a *Church* Dedicated to St. *Theodosia*.

Gianghir, a *Mosch* so call'd upon a Hill at *Fondaclee* near *Tophana*.

In *Constantinople* there are several Narrow Streets of Trade, clos'd up with Sheds and Pent-houses; which I suppose were in use before the *Greeks* lost their Empire, and are the same with the σκεπασοὶ καὶ φραχτοὶ δρόμοι in *Chrysaloras* his Epistle. But besides these Places, several Trades have their Distinct Quarters. The Streets are Rais'd for the most part on each side for the greater Convenience.

Not far from *Suleimania* is the House of the *Aga*, or *General* of the *Janizaries*, which so often changes its Masters.

Pompey's Pillar, as the *Franks* Erroneously call it, is of the *Corinthian Order* Curiously Wrought, about 18 *Foot* in Height and 3 in Diameter.

Beshiktash, a Village within 2 or 3 *Miles* of *Constantinople* towards the *Bosphorus*, where lies Bury'd the Famous Pyrate *Ariadin*, whom the *Christian* Writers call *Barbarossa*, who Built here a Handsome *Mosch*, having two Rows of *Pillars* at the entrance. The *Captain Bassa* usually before he Puts to Sea with his *Armata* or *Gallies*, visits the Tomb of this Fortunate Robber, who had made several Thousand *Christian* Slaves, and makes his Prayers at the Neighhouring *Church* for the good Success of his Expedition.

They Reckon in the City above 100 *Publick Baths*, every Street almost affording one. They are Esteem'd Works of great *Piety* and *Charity*, there being a continual Use of them, not upon the Account of *Religion*, but of *Health* and *Cleanliness*. For their Diet, being for the most part Hot Spiced Meats in Winter, and Crude Fruits in the Summer; their Liquor, Fountain Water, or Coffee; to which we may add their Lazy kind of Life; (for Walking is never used by them for Digestion, or otherwise in the way of Diversion,) frequent *Bathing* becomes Necessary.

There are several *Receptacles* of *Water* under Ground, and one particularly under the *Church* of *Sancta Sophia*, as I was informed; but I did not think it worth my Curiosity to Descend into it. These were of great use to the Poor *Greeks* in the last Fatal Siege; but the *Turks* are so Secure, that they do not think, that they Deserve either Cost or Pains to keep the Waters Sweet, or the Cisterns in Repair.

The *Aquæducts*, which answer to those Glorious *Aquæducts* near *Pyrgos*, and Convey the Water to the Great Cistern near *Sultan Selim*'s *Mosch*, are in that part of *Constantinople*, which lies between the *Moschs* of *Mahomet the Great* and *Sha-zade*.

The *Turks* began to Besiege *Constantinople* on the 5*th* of *April*, and took it the 29*th* of *May*, on *Whitsun-Teusday* Morning, 1453, or as the *Turks* Reckon, in the Year 857 of the *Hegira*, or *Flight* of *Mahomet*, the 22*d* Day of the *First Jomad*.

The *Chappel* where *Ejub Sultan* is Interred, at whose Head and Feet I observed Great Wax-Candles, is Enclos'd with Latten Wire Grates, for the better Accomodation of such Religious *Turks*, as come to pay their

Respect

Reſpect to the Memory of this great *Muſſulman Saint*. In the Middle of the *Area*, there is Raiſed a Building Suſtain'd by excellent *Marble Pillars*, Aſcended by two ſeveral pair of Stairs, where the *New Emperor* is *Inaugurated*, and where he uſually goes in *Biram* Time.

3. *Montanea* formerly call'd *Nicopolis*, according to *Bellonius*, or rather *Cios*, the Bay hence called *Sinus Cianus*, lies in the Bottom of a Bay about 80 *Miles* from *Conſtantinople*, and is the *Scale*, or Landing-place for *Pruſa*, from which it may be about 12 *Miles*; in the middle way to which is the Village *Mouſſanpoula*.

Pruſa, now Called by the *Turks Burſia*, the chief City of *Bithynia*, is Seated at the Foot partly, and partly upon the Riſing of the Mount *Olympus*, which is one of the Higheſt Hills of the *Leſſer Aſia*. Its Top is covered with *Snow* for 9 or 10 *Months* of the Year, ſeveral Streams of Water flowing down the Hill continually, Accounted very *Unwholeſome* from the *Snow* Mixed with it. In the upper part of the City, to the Northweſt, lies the *Seraglio*, which is Walled round: but the Emperors not Reſiding here ſince their Acquiſts in *Thrace*, or ſcarce making Viſits to this Imperial City; and none of their *Sons* Living here of late, according to the Former Policy of the *Turkiſh* Emperors, who did not permit their *Sons* when Grown up to be near them, but ſent them to ſome honourable Employment, accompanied with a Baſſa and Cadi to inſtruct them in the Arts of War and Government, it lies now Neglected and Diſpoyled of all it's Ornaments.

An Account of Pruſa *in* Bythynia: *and the Obſervations in* Turkey *continued*; *by Dr.* Tho. Smith. n. 155. p. 431.

In this part alſo are the *Sepulchers* of *Oſman*, the Founder of the Family which now Reigns, and his Son *Urchan*, who took the City, near a *Moſch*, formerly a *Chriſtian Church* dedicated to St. *John*, and where was formerly a *Convent* of *Religious* Built by *Conſtantinus Iconomachus*, where I ſaw the Figure of a *Croſs* ſtill remaining upon the Wall. Here hangs up a *Drum* of a vaſt bigneſs, ſuch as they carry upon the backs of *Camels*, and I ſuppoſe is one of thoſe, which they uſed in Taking of the Place.

In the Lower part, near the bottom of the Hill, *Morad* the 2d. the Father of *Mahomet* the *Great*, lies *Buried*: near whereunto was formerly the *Metropolitical Church* of the *Holy Apoſtles*. The *Bezeſten*, or *Exchange*, ſeems to be much Better and Larger than the Great one at *Conſtantinople*; as are ſeveral *Caravanſeras* built for the Uſe and Accommodation of Merchants, and Travellers.

Without the City toward the Eaſt, is the *Moſch* and *Sepulcher* of the Emperor *Bajazid* the *Firſt*, whom the *Turks* call *Jilderim*, or *Lightning*, and the *Greek* Writers Δαίλαφ. Not far from hence is the *Moſch* of *Mahomet* the *Firſt*, and his *Sepulcher*. Toward the Weſt, upon the ſide of the Hill, is the *Moſch* of *Morad* the *Firſt*, whom they call *Gazi*, or the *Conqueror*, near which he lies *Bury'd*. There are in the whole about 124 *Moſchs*, ſeveral of which were formerly *Chriſtian Churches*, and between 50 and 60 *Chanes*. The *Caſtles* built by *Oſman*, when he Beſieg'd the City, are Slighted and Unfortify'd, the one to the North, the other to the South-Weſt.

At *Checkenghe*, about a *Mile* and a *half* out of Town, are the *Hot-Baths*, much frequented both by *Chriſtians* and *Turks*. They are made very Convenient to *Bath* in, and are Cover'd over, that they may be uſed in all Weathers. Among others there is a Large Round Baſin, where they uſually Divert themſelves by Swimming.

What Opinions the *Turks* have of our *B. Saviour*, and the *Chriſtian Religion*, I ſhall briefly ſhew, as they lie diſperſed in ſeveral Chapters of their *Alcoran*, according to which they Frame their Diſcourſe whenſoever either their Zeal or Curioſity puts them upon this Topick. For *Mahomet*, upon his Setting up to be the Author of a *New Religion*, finding ſuch a conſiderable Part of the World Profeſſing the *Doctrine* of *Chriſt*, with all the *Myſteries* of *Faith* therein contain'd, was caſt upon a Neceſſity of ſaying ſomething both concerning *Him* and *It*. By which it will appear, how great the Power of Truth is above Impoſture and Subtility, and that as the *Devils* in the *Poſſeſſed* Confeſt, though againſt their Wills, *Chriſt* to be the *Son of God*, ſo this *Dæmoniack* in the midſt of all his Forgeries, and Lies, and Ridiculous and Childiſh Narratives, not being able to Contradict the Univerſal Belief of the *Chriſtians* of that and the preceding Ages, Founded on the Hiſtory of the *Goſpel*, hath been forc'd to give Teſtimony to ſeveral Particulars of it.

They Confeſs that *Chriſt* was Born of a Pure Spotleſs *Virgin*, the *Virgin Mary*, Choſen by *God* and Sanctify'd above all Women in the World; and that the *Angel Gabriel* was Diſpatch'd out of Heaven to acquaint her with the News of it. That ſuch a kind of *Miraculous* and *Supernatural Birth* never happen'd to any beſides, and that *Chriſt* was Conceiv'd by the *Holy Ghoſt*, and that he Wrought Mighty *Miracles*, for inſtance, that he *Cleanſed Lepers*, gave *Sight* to the *Blind*, Reſtor'd *Sick* Perſons to their *Health*, and *Raiſed* the *Dead*. That he is a Great *Prophet*, ſent by God to Convert Men from the Vanity and Error of their Falſe Worſhip to the Knowledge of the *True God*, to Preach Righteouſneſs, and to Correct and Reſtore the Imperfection and Miſcarriages of Humane Nature; that he was of a moſt *Holy* and *Exemplary Life*; that he was the *True Word of God*, the *Apoſtle*, or *Ambaſſador of God*; that his *Goſpel* was *Revealed* to him from Heaven, and that he is in Heaven Standing nigh to the *Throne* of *God*. They Blaſpheme indeed with a Brutiſhneſs and Stupidity only befitting *Turks*, the Myſteries of the *Holy Trinity*, and of the *Divinity* of our *B. Saviour*, and Deny that he was *Put* to *Death*, and ſay that *Another*, in his Shape, was *Crucify'd* by the *Jews*, and that He himſelf was *Aſſum'd* into Heaven in his Body without *Dying* at all, and conſequently they will not own, that he *Satisfy'd* Divine Juſtice for the Sins of the World; ſo great an Affinity is there between the *Hereſy* of *Socinus* and Profeſt *Mahometaniſm*.

I could never yet ſee any *Turkiſh Tranſlation* of the *Alcoran*; they Cry up the *Elegance* of the *Style*, which being *Enthuſiaſtick* and High-flown, by reaſon alſo of the Tinckling of the Periods, is very Delightful to their Ears, who ſeem to be Affected with *Rythme* mightily. Though I ſuppoſe it is upon a more Politick accompt, that they are ſo Averſe, as to the *Tranſ-*

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lating it into their Vulgar Language, not out of Reſpect to the Sacredneſs of the Original only, whoſe Full Commanding Expreſſions they think cannot be *Tranſlated* without a great Diminution to the Senſe; but to keep it in greater Veneration among the People, who might be apt to Slight and Diſeſteem it, ſhould it become thus Common amongſt them. It is enough that the *Prieſts* and *Learned* Men Explain the Difficult Paſſages of it to the People, and Write Commentaries for the Uſe of the more Curious and Inquiſitive. The *Perſians*, on the contrary, think it no Diſparagement to the *Arabick*, or Profanation of the Senſe, to *Tranſlate* this Curſed Book into their Own Language, and Copies are frequent among them.

The *Grand Signor's Women* are uſually the Choiſeſt Beauties of the *Chriſtian* Spoils, preſented by the *Baſſa's*, or *Tartars*. The Preſent *Sultana*, the Mother of the young Prince *Muſtapha*, is a *Candiot*; the *Valide*, or Emperor's Mother, a *Ruſſian*, the Daughter of a Poor Prieſt, who with her Relations were ſeiz'd upon by the *Tartars* in an Incurſion, which they made into the *Muſcovites* Country. She being receiv'd into the *Seraglio*, by her Beautiful Complexion and Cunning Behaviour, gain'd the Heart and Affection of Sultan *Ibrahim*, (a Man wholly Addicted to Soft Pleaſures, and who ſeldom cared to be long Abſent from the Womens Appartment, but Choſe to ſpend his Time among them.) Having the good Fortune to be the Mother of the Prince *Mahomet*, the Eldeſt Son of his Father, who now *Reigns*, ſhe had all the Honours that could poſſibly be done her, and was the Beloved *Hazaki*, or Chief Concubine. During this Height of Splendor and Glory, the Court removing from *Conſtantinople* to *Adrianople*, diſtant about 120 *Miles*, as ſhe was Paſſing in great State attended with her Guards, through the Streets of the City, in a Coach much like our Carriage Wagons, but that they are Latticed to let in the Air, (for no one muſt Preſume to Stare or ſcarce look upon the Women, much leſs muſt they themſelves ſuffer their Faces to be Seen in this Jealous Country,) ſhe out of Curioſity looking through the Holes, ſaw a Poor *Chriſtian* Slave in a Shop, where Sugar and ſuch like Wares were ſold. Upon her Return ſhe ſent one of her *Eunuchs* to enquire for the Perſon, and to Ask him ſeveral Queſtions about his Country, Relations, Friends, and the Time when, and how long he had been a Slave: His Anſwers were ſo Particular and Satisfactory, that ſhe was ſoon Convinc'd of the Truth and Certainty of her Apprehenſions, when ſhe firſt caſt her Eyes upon him, that he was her Brother, and accordingly it proved ſo. Whereupon acquainting the Emperor with it, ſhe immediately Redeem'd him from his Patron, and having made the Poor Wretch turn *Turk*, got him conſiderably Preferr'd.

The *Baſſa's* for the moſt part are the Sons of *Chriſtians*, taken into the *Seraglio*, near the *Emperor*'s Perſon, and ſo are Preferr'd to Conſiderable Governments, or elſe they Raiſe themſelves by their Conduct and Valour. *Mahomet Baſſa* in the time of *Achmet*, whoſe Eldeſt Daughter he Marry'd, was the firſt Natural *Turk*, that was made *Chief Vizir*, having before been *Captain Baſſa*. The *Chief Vizor Mahomet Kupriuli*, (who Settled the Empire in the Minority of this Emperor, when it was ready to be ſhaken into

Pieces, and Diſſolv'd by ſeveral Powerful Factions in the State, and by the Mutinies and Diſcontents of the *Janizaries* and *Spahi's*, who drove different ways) was an *Albaneſe* by Birth, the Son of a *Greek Prieſt*, whom out of the Height of his Zeal for *Mahomet*, he made Turn *Turk* in his Old Age, and Converted the *Chriſtian Church* in the Village where he was Born, into a *Moſch*. This Man alſo forbad the *Derviſes* to Dance in a Ring and turn Round, which before was their Solemn Practice at Set Times before the People, which they would do ſo long, till they were Giddy by this ſwift Circular Motion, and fell down in a Swoon, and then oftentimes upon their Recovery from ſuch Trances they Pretended to *Revelation*. The *Church-men* are not very kind to his Memory, looking upon him as a Man of Little or No Religion; and they give out that if he had Liv'd, He would have forbid their *Calling to Prayers* from the Spires of their *Moſchs*, and *Hanging out Lamps*; both which they look upon as Solemn and Eſſential to the Exerciſe of Religion, but He, as the Effect of Bigotry and Superſtition.

They have a mighty Honour and Eſteem for *Phyſicians*, for though they are of Opinion, that they cannot with all their Art, Prolong Life, the Period and Term of it being Fatal and abſolutely Determin'd by God, yet they often Conſult them upon any Violent Sickneſs or Pain, in order to make the time allotted them in the World more Pleaſant and Eaſy. It is extraordinary rare that a *Natural Turk* makes Phyſick his Profeſſion and Study. They who Practiſed it among them, when I was in *Turkey*, were for the moſt part *Greeks* and *Jews*, who know nothing of *Chymical* Medicines, but follow the uſual Methods which they Learn'd in *Italy* and *Spain*, the former having Study'd in *Padua*, and the latter in *Salamanca*, where they paſs'd for good *Catholicks*. And I remember I met with a certain *Jew Phyſician*, who had been a *Capucin* in *Portugal*. During the Tedious Siege of *Candia*, the *Vizir*, what with Melancholy, and what with the Ill Air of the Camp, finding himſelf much Indiſpoſed ſent for a *Chriſtian* Phyſician Signior *Maſſalim*, a Subject of the Republick of *Venice*, but Marry'd to a *Greek* Woman, to come ſpeedily to him, and made him a Preſent of about 1000 *Dollars*, in Order to fit himſelf for the Voyage and bear the Expence of it. By this Worthy Gentleman's Care, he Recover'd his Health, and would not permit him to Depart, till after the Surrendry of that City, which might be about 7 *Months* after his Arrival there, treating him in the mean while with all Imaginable Reſpect. During our ſhort ſtay at *Burſia*, one of our *Janizaries* accidentaly Diſcourſing with a *Turk* about us, whom they knew to be *Franks*, told him, that there was a *Phyſician* in the Company, who had been lately at the *Grand Signor*'s Court at *Saloniki* with the *Engliſh Ambaſſador*, and was now upon his Return from *Conſtantinople* to *Smyrna*, where he Liv'd. This preſently took vent, and the *Turks* thought that they had got a Man among them, that could Cure all Diſeaſes infallibly; for ſeveral came immediately to find us out in behalf of Themſelves or their Sick Friends, and one of the moſt conſiderable Men upon the Place, deſir'd the *Doctor* to go to his Houſe to

Viſit

Visit one of his Women Sick in Bed, who being permitted to feel her Naked Pulse (for usually they throw a piece of fine Silk or Curle over their Womens Wrists at such times) soon discover'd by that and other Symptoms and Indications of her Distemper, that *Opening a Vein* would presently give her Ease and Recover her; which he did accordingly: for which he receiv'd an Embroider'd *Handkerchief* instead of a Fee, and Gain'd the Reputation of having done a Mighty Cure.

They have little of Ingenious or Solid *Learning* among them; their Chief Study, next to the *Alcoran*, being *Metaphysical* Nicetie's about the Attributes of God, or else the Maintenance of Odd Speculative Notions and Tenets, deriv'd down to them from some of their Fam'd Masters and Holy Men, whom they pretend to follow, Their Knowledge of the *Motion* of the *Heavens*, for which the *Arabians* and other *Eastern Nations* have been so Deservedly Famous, as their *Astronomical Tables* of the *Longitude* and *Latitude* of the *Fixed Stars*, and of the *Appulse* of the *Moon* to them, fully Evince, is now very Mean, and is chiefly study'd for the use of *Judiciary Astrology*. The Great *Instrument* they make use of is an *Astrolabe* with which they make very Imperfect *Observations*, having no such thing as a *Quadrant* or *Sextant*, much less a *Telescope*, or any Mechanical Engine, to Direct and Assist them in their *Calculation*.

Their Skill in *Geography* is as inconsiderable; I remember I heard the *Captain Bassa*, whom they Style *Admiral* of the *Black* and *White Seas*, meaning the *Euxine* and *Mediterranean*, ask this silly Question, Whether *England* was out of the *Straits*? And at another time the *Caymacan* or *Governour* of *Constantinople*, hearing that *England* was an Island, desir'd to know how many Miles it was about, in order, we suppos'd, to make an Estimate of our King's Greatness and Strength by the Extent and Compass of it.

One of the great *Astrologers* of *Constantinople*, having heard that I had a Pair of *Globes* in my Chamber, made me a Visit on purpose to see their Contrivance; being Introduced by a worthy Gentleman of our own Nation. After the first Ceremonies were over, I took my *Terrestrial Globe*, and Rectifyed it to the Position of the Place, and Pointed to the several *Circles* both without and upon it, and told him in short the several Uses of them: then shew'd him how *Constantinople* bear'd from *Candia* (at that time Besieged,) *Cair*, *Aleppo*, *Mecca*, and other chief Places of the Empire, with the other Parts of the World: at which he was mightily Surprised to see the whole Earth and Sea Represented in that Figure, and in so Narrow a Compass, and Pleased himself with Turning the Globe round several times together. Afterwards I set before him the *Celestial Globe*, and Rectified that, and shewed him how all the Noted *Constellations* were exactly Described, and how they Moved Regularly upon their *Poles*, as in the *Heavens*; some Rising and others Setting, some always Above the *Horizon*, and others always Under, in an *Oblique Sphere*, and particularly what Stars would Rise that Night with us at such an Hour; the Man seem'd to be Ravished with the Curiosity of it, Turning this Globe also several times together

gether with his Finger, and taking a mighty pleasure in viewing the motion of it; and yet this Silly Animal past for a *Conjurer* among the *Turks*, and was lookt upon as one, that could Foretell the Events of Battels, and the Fates of Empires, and the End of the World.

They have no Genius for *Sea-voyages*, and consequently are very Raw and Unexperienced in the Art of *Navigation*, Scarce venturing to Sail out of Sight of Land. I speak of the *Natural Turks*, who Trade either into the *Black Sea* or some part of the *Morea*, or between *Constantinople* and *Alexandria*; and not of the Pyrats of *Barbary*, who are for the most part *Renegado*'s, and Learn their Skill in *Christendom*, which they Exercise so much to the Terror and Damage of it. A *Turkish Compass* consists but of 8 *Points*, the 4 *Cardinal* and 4 *Collateral*; they being at a mighty loss how to Sail by a side Wind, when by Hauling their Sails *Sharp*, they might lye their *Course*, and much more when they are in the *Wind's Eye*, not knowing how to make *Tacks* and *Boords*, but choose rather to make Hast into some Neighbouring *Port*, till the Wind blows *Fair*.

They trouble not themselves with Reading the *History* of other *Nations*, or of Ancient Times, much less with the Study of *Chronology*, without which *History* is very Lame and Imperfect; which is the Cause of those Ridiculous and Childish Mistakes, which pass Current and Uncontradicted among them. For Instance, they make *Job* one of *Solomon*'s *Judges* and (*Iscander*) *Alexander* the Great *Captain General* of his *Army*. They number *Philip* of *Macedon* among the *Ancestors* of our *B. Saviour*, and believe that *Sampson*, *Jonas*, and St. *George* were his Contemporaries. In this they are more Excusable than their *False-Prophet Mahomet*, who in his *Alcoran* has perverted several *Historicall* notices in the Writings of the *Old Testament*, and is guilty of vile and Absurd *Pseudo-chronismes*. To Remedy this Defect, of which he was very Conscious, and the better to understand the State of *Christendom*, and the particular Kingdoms and Republicks of it, the late *Great* and *Wise Vizir Achmet*, made his Interpreter *Panagiotti*, a Learn'd *Greek*, at Leisure hours, even at the Siege of *Candia*, as well as other times, Read several Ancient *Histories* to him, and Render them *ex tempore* into the *Turkish* Language, and particularly *Blaeu*'s *Atlas*, with which he was mightily pleased, and made great Use of, and truly gained the Reputation of a Solid and Judicious *Statesman*, as well as *Souldier*, among the *Christian* Ministers, who in the Ordinary Course of their Negotiations apply'd themselves to him.

Though their *Year* be according to the *Course* of the *Moon*, and so the *Turkish Months* run round the *Civil Year* in a Circle of 33 *Years*, and a few odd *Days*, yet they Celebrate the *Neuruz*, which signifies in the *Persian* Tongue the *New Year* the 21 *day* of *March* (on which Day the *Vernal Equinox* was Fix'd by the *Greeks* and other *Oriental Christians*, in the time of the Emperor *Constantine*, who made no Provision for *προήγησις ἰσημερινὴ* or *Precession*, which in Process of Time the Inequality between the *Civil* and *Astronomical Year* must necessarily Produce) at which time the *Cadyes* and other *Annual Magistrates*, and *Farmers* of the *Customs* take place, and Reckon to that *Day Twelve Month* again.

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In their *Civil* Deportment and Behaviour one towards another, the *Left Hand* is the more Worthy and Honourable Place, except among their *Eccleſiaſticks*; and the Reaſon they alledge is, becauſe they *Write* from the *Right Hand*, and the *Sword* is worn on the *Left Side*, and ſo is more at his Diſpoſal who walks on that Hand. The *Chief Vizir* accordingly in the *Divan* ſits at the *Left Hand* of the *Muphty*, each maintaining their Right of Precedence according to this way of Deciſion.

In their *Moſchs* they Sit without any Diſtinction of Degrees.

Some of the more *Zealous Turks* cauſe to be Engraven on their *Scymitars* and *Bucklers* a Sentence out of the 61 *Surat*, which is concerning *Fighting*, or *Battel Array*, and contains Encouragement to *Fight in the way and Path of God*, as the Impoſtor words it; for which he aſſures them, beſides, Aſſiſtance from Heaven to help them to get the victory over their Enemies, and that *God* will *Pardon their Sins* and bring them to *Paradiſe*. Thus Spirited with Zeal, a *Turk* lays about him with Fury, when he is a Fighting, and ſeems Ambitious of *Dying* to gain the Delights of *Paradiſe*, at leaſt indifferent whether he *Dies* or *Lives*.

The *Turks* are as to their *Temper*, Serious, or rather inclining to Moroſity, ſeldom Laughing, which is accounted an Argument of great Vanity and Lightneſs. They perform the Exerciſes, which they Uſe in the way of Diverſion, as ſhooting and Hunting with a great deal of Gravity, as if they Deſigned them more for Health than for pleaſure; and this too but ſeldom. The Better and Richer ſort, who have nothing to do, ſit all day at Home, Lolling upon a *Sofa*, or *Raiſed Place* in their Rooms, and taking *Tobaco*, which their Slaves fill and Light for them: and if they Retire in the Summer or Autumn, for a Week or Fortnight to ſome convenient Fountain in a Wood with their Women, it is chiefly to enjoy the Refreſhments of the Cool Air. In times of *Triumph* indeed for ſome Great ſucceſs obtain'd againſt the *Chriſtians*, when the *Shops* are open for 3 *Nights* together, and Hung with *Lights* as well as the *Spires* of the *Moſchs* in curious *Figures*, they are guilty of Extravagant Mirth, Running up and down the Streets in Companies, and ſometimes Singing and Dancing after their Rude Way; but this Fit being over they ſoon return to their former *Melancholy*. In the *Coffee-Houſes*, where they uſe to reſort to Tipple, there is uſually one Hired, by the Owners, to Read either an Idle *Book of Tales*, which they Admire as Wit, or Filthy *Obſcene* Stories; with which they ſeem wonderfully Affected and Pleaſed, few of them being able to Read. Theſe are the *Schools* which they frequent for their Information, tho' in Times of War, when things went ill with them, their Diſcourſes would be of Ill Government; and the *Grand Signor* himſelf and his Chief Miniſters could not eſcape their Cenſures; which manifeſtly Tending to Sedition, and to the Heightning of their Diſcontents, by their Mutual Complaints, and by this Free Venting of their Grievances during the War at *Candia*, the Wiſe *Vizir*, ſeeing the Evil Conſequences that would follow, if ſuch Meetings and Diſcourſes were any longer Tolerated, commanded that all the Publick *Coffee-Houſes* ſhould be ſhut up in *Conſtantinople*, and ſeveral other great Cities of the Empire, where the Malecontents uſed to

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Rendezvouz themſelves, and find Fault upon every Ill Succeſs and Miſcarriage, with the Adminiſtration of Affairs.

The *Cuſtome* of the *Turks* to *Salute* the *Emperor*, or the *Vizir Baſſa*'s, with Loud Acclamations and Wiſhes of Health and Long Life, when they appear firſt in their Houſes, or any Publick place, is Derived from the *Greeks* who took it from the *Romans*. This was done by them in a kind of Singing Tone; whence *Luitprandus*, Biſhop of *Cremona*, tells us, That in a certain *Proceſſion* (πρόελευσις) at which he was Preſent, they *Sang* to the *Emperor Nicephorus* πολλὰ ἔτη that is, *Many Years*, (which *Codinus*, who Lived juſt about the taking of *Conſtantinople* by the *Turks*, expreſſes by τὸ ψάλλειν τὸ πολυχρόνιον, or by τὸ πολυχρόνιζειν, and the *Wiſh* or *Salute* by πολυχρόνισμα) and at Dinner the *Greeks* then Preſent *Wiſhed* with a Loud Voice to the *Emperor* and *Bardas*, *ut Deus Annos Multiplicet*, as he Tranſlates the *Greek*.

The *Turkiſh Coin* in itſelf is Pitiful and Inconſiderable, which I aſcribe not only to their want of *Bullion*, but to their Little Skill in matters relating to the *Mint*. Hence it comes to paſs, that *Zecchines* and *Hungars* for *Gold*, and *Spaniſh Dollars* and *Zallots* for *Silver*, Stampt in *Chriſtendom* paſs Current among them; moſt of the great Payments being made in them, they not Caring either through Ignorance or Sloth to follow the Example of the *Indian* or *Perſian Emperors*, who uſually Melt down the *Chriſtian Money* Imported by the Merchants into their ſeveral Countries, and give it a New *Stamp*. The moſt Uſual Pieces are the *Sheriphi* of *Gold*, ſomewhat leſs in Value than a *Venetian Zecchine*; and *Aſpers*, Ten of which are equal to 6 Pence *Engliſh*; and ſome few *Three-Aſper* Pieces. A *Mangur* is an Ugly Old *Copper Piece*, 8 of which make but one *Aſper*; and is not I think a *Turkiſh Coin*, but rather *Greek*. They have no *Arms*, upon their *Coin*, only *Letters* Emboſſed on both ſides, containing the *Emperor's Name*, or ſome ſhort Sentence out of the *Alcoran*.

The *Turks* look upon *Earthquakes* as Ominous; as the Vulgar do upon *Eclipſes*, not underſtanding the Philoſophy of them. During my ſtay in *Conſtantinople*, which was above 2 *Years*, there happen'd but One, which was *Oct.* 26. 1669. about 6 a *Clock* in the *Morning*, a Stark Calm Preceding. It laſted very near a *Minute*, and we at *Pera* and *Galata* were as ſenſible of it, as thoſe who were on the other ſide of the Water: but Praiſed be God, nothing Fell, and we were ſoon rid of the Fears in which this Frightful Accident had caſt us.

The *Turks* made Direful Reflexions on it, as if ſome Calamity would inevitably fall upon the *Empire*, quickly forgetting the great Triumphs and Rejoycings which they expreſt but a few Days before for the Surrendry of *Candia*. In the *Year* 1668. in *Auguſt*, the *Earth ſhook* more or leſs 47 *Days* together in the *Leſſer Aſia*, at *Anguri* (*Ancyra*), and for 15 at *Bacbaſar*, as we heard from a *Scotch Merchant*, who Liv'd there: and particularly, that at this Latter Place, on the 2*d* of *Auguſt*, between 3 and 4 of the Clock in the *Afternoon*, it laſted for a *quarter* of an *Hour*; ſeveral Houſes were *Overthrown*, and ſome hundreds of Chimneys *Fell* (it being a very Populous

lous Town) and yet there were but 7 *Kill'd.* The *Trembling* being ſo violent, both *Turks* and *Chriſtians* forſook their Houſes, and betook themſelves to the *Fields*, *Vineyards*, and *Gardens*, where they made their abode for ſeveral Days.

Their *Puniſhments* are very Severe; this being judg'd the moſt Effectual Way to Prevent all *Publick Diſorders* and *Miſchiefs.* They uſe no great Formality in their *Proceſſes*: If the *Criminal* be taken in the Fact, and the *Witneſſes* Ready and Preſent to Atteſt it, and ſometimes if there be but *Probable* Circumſtances, without Full Conviction, they *Condemn* him: and ſoon after Sentence, ſometimes in an *Hour* or *Leſs*, Hurry him away to *Execution.* For an Ordinary Crime, *Hanging* is the Uſual Death: but for *Robbery* and *Murder*, Committed upon the *High-Way* by ſuch as Rob in Parties and Alarm whole Provinces, or for *Sacrilege*, or for any *Hainous Crime*, againſt the *Government*, either *Gaunching* or *Excoriation*, or *Cutting* off the *Legs* and *Arms*, and leaving the *Trunk* of the *Body* in the High Way, or *Empaling*, that is, Thruſting an Iron Stake through the Body out under the Neck, or at the Mouth, in which *Extreme Torment* the Miſerable Wretch may Live 2 or 3 *Days*, if the *Guts* or *Heart* happen not to be Wounded by the Pointed Spike in its Paſſage. This *Puniſhment* ſeems to have been in Uſe among the *Romans*; *Seneca's Epiſtle* 14 *Cogita hoc loco Carcerem, & Cruces, & Eculeos, & Unoum, &* Addactum *per* Medium Hominem, *qui per* Os *emergat, ſtipitem*: and ſo in his Book *De Conſolatione ad* Marciam. *Cap.* 20. *Alii Capite converſos in terram ſuſpendere: alii per Obſcœna Stipitem egerunt, Alii Brachia Patibulo explicuerunt. Murder* is ſeldom *Pardoned*, and eſpecially if the Relations of the *Murdered* Perſon Demand Juſtice.

The *Circumciſion*, tho' it be a *Sacred Rite*, is perform'd in their Private Houſes, and never in the *Moſchs.*

The *Women* Colour their *Eye-brows* and *Lids* with an Ugly *Black* Powder, I ſuppoſe to ſet off their *Beauty* by ſuch a Shadow; and their *Nails* with the Powder of *Kanna*, which gives them a Tincture of Faint *Red*, like Brick (as they do the *Tails* and *Hoofs* of *Horſes*) which they look upon as a great *Ornament.* Their great *Diverſion* is *Bathing*; ſometimes Thrice, if not Four Times a Week. They do not Permit them to go to *Church* in time of *Prayer*, for fear they ſhould ſpoil their Devotion; the *Turks* being of ſo Brutiſh a Temper, that their Luſt is Raiſed upon the ſight of a Fair Object. They are Call'd oftentimes by the *Names* of *Flowers* and *Fruits*, and ſometimes *Phantaſtick Names* are given them, ſuch as *Sucar Birpara*, or Bit of Sugar; *Dil Ferib*, or Raviſher of Hearts; and the like.

Their Skill in *Agriculture* is very mean. In their *Gardens* they have ſeveral little *Trenches* to Convey Water where it may be moſt Neceſſary for their *Plants* and *Flowers.* They know little or nothing of *Manuring* their Grounds: ſometimes they *Burn* their Fields and Vineyards after Harveſt and Vintage, Partly to *Deſtroy* the *Vermine*, and partly to *Enrich* the *Soil.* They *Tread out* their *Corn* with *Oxen*, drawing a ſquare Plank-board, about a *Foot* and a *half* or *two Foot* over, Studded with Flints; and *Winnow* it upon their

Threshing Floors in the open Air, the Wind blowing away the Chaff. They *Feed* their *Horses* with *Barley* and *Chopt Straw*; for I do not remember ever to have seen any *Oats* among them; and they make but little *Hay*.

For *Draught* of great Weight in their Carts, they make use of *Buffalo's*.

Camels will endure Travel 4 *Days* together without *Water*, and will Eat Tops of *Thistles*, *Shrubs*, or any kind of Boughs. They are very Sure-footed, and Kneel when they are a Loading. They Live to a considerable Number of *Years*, some even to 60.

The chief Furniture of their Houses, are *Carpets*, or *Matts*, of *Grand Cairo*, neatly Wrought with Straw, spread upon the Ground; they having no Occasion for *Chairs*, *Couches*, *Stools*, or *Tables*, their Postures within Doors, being different from ours. They have no *Hangings*, but their Walls are Whited and set off with *Painting*, only adorn'd with a kind of *Porcelane*; no *Beds* closed with *Curtains*.

They *Seal* not with *Wax* but *Ink*, at the bottom of the Paper; the *Emperor's* Name being usually written with Flourishes and in Perplext Characters: Nor have they any *Coats of Arms* upon their *Seals*, there being no such thing as *Gentility* among them.

Some of them, notwithstanding their Zeal for *Mahomet*, and the *Religion* by him establish'd, retain not only a Favourable and Honourable Opinion of our *Blessed Saviour*, but even place some kind of Confidence in the Usage of his *Name*, or of the Words of the *Gospel*, though it may seem to be wholly in the way of Superstition. Thus in their *Amulets*, which they call *Chaimaili*, being little bits of Paper of 2 or 3 Fingers breadth, roll'd up in pieces of Silk, containing several short Prayers and Sentences out of the *Alcoran*, with several Circles with other Figures, they usually Inscribe the Holy and Venerable Name of *JESUS*, or the Figure of the *Cross*, or the first Words of St. *John's Gospel*, and the like. They Hang them about their Necks, or place them under their Arm-pits, or in their Bosoms near their Hearts, (being the same with what the *Greeks* call ἐγκολπια) and especially when they go to War, as a Preservative against the Dangers of it; and indeed against any Misfortune whatsoever. Some have them Sow'd within their Caps: and I heard of a *Turk*, that was so Superstitious herein, that he always pluckt it off, and was Uncover'd when he had occasion to make Water. Some are such Bigots in their *Religion*, and so Furious against *Christians*, that not only they treat them with all Imaginable Scorn and Contempt, but take it ill to be *Salam'd*, or *Saluted* by them; as if it were the Effect of Sawcinesse or Unbecoming Familiarity. Their Malice against the *Christians* makes them Envy the Rich Furrs they Line their Vests with, and 'tis a trouble to these Hypocritical Zealots, to see the *Francs* Ride upon their Fine *Arabian* Horses.

The Respect which they shew the *Alcoran* is wonderfull; They dare not open the Leaves of it with Unwashen Hands, according to the Advice or Command written in *Arabick* upon the Cover, *Let no one Touch this Book*

but

but he that is Clean. They Kiſs it and bend their Heads, and touch their Eyes with it, both when they Open it and Shut it.

The *Janizaries*, when they Attend upon *Chriſtian Ambaſſadors* to their *Audience*, ſeem to appear in their Bravery, and in a Habit far from that of a *Soldier*, being without either *Fire-Arms*, or *Swords*, (which latter are not Worn but in Time of Service, or when they are upon a March, or Embody'd,) wearing a Cap made of *Camel's Hair*, with a broad Flap Dangling behind, a Gilt Embroider'd Wreath running round it, and an Oblong Piece of Braſs riſing up from the middle of their Fore-head near a Foot, with a great Club in their Hand, like Inferiour Officers of the *Civil Government*. But when they are in the *Camp*, they Throw off their upper Veſt, and *Turbants*, which they Wear at all other uſual Times, as Troubleſome, and put on a *Feſs*, or Red Cap, which ſits cloſe to their Head, and tuck up their *Duliman*, or Long Coat to their Girdle, that they may be the more Quick and Expedite in their Charge.

They affect Finery and Neatneſs in their Cloaths and Shaſhes; not ſo much as a Spot to be ſeen upon them, and in Rainy or Suſpicious Weather, are very Carefull how they go abroad without their *Yamurlicks*, which is a kind of Coat they throw over their Heads at ſuch times.

Their Pans and Diſhes are for the moſt part of *Copper*, but ſo handſomely *Tinn'd* over, that they look like *Silver*.

There are Thouſands of *Gypſies* or *Zinganies* in *Turkey*, who Live the ſame Idle Naſty kind of Life, as they do in *Chriſtendom*, and Pretend to the ſame Art of *Telling Fortunes*; and are look'd upon as the Off-ſcouring of Mankind. It is accounted the extreameſt Point of Human Miſery to be a *Slave* to any of this ſort of Cattle.

The *Haggai*, or *Pilgrims*, that have been at *Mecca* and *Medina*, forbear to Drink Wine moſt Religiouſly, out of a Perſuaſion that one Drop would Efface all the Merits of that Troubleſome and Expenſive Journey: and ſome have been poſſeſt with ſuch a Mad Zeal, that they have *Blinded* themſelves after their having been bleſt with the Sight of *Mahomet's Sepulcher*.

After *Jatzib*, that is an *Hour* and *half* in the Night, throughout the whole Year, there is as Great a *Silence* in the *Streets* as at Midnight: The Emperor *Achmet*, in the Year 1611, having made an Order, That no one ſhould Preſume to be out of his Houſe after that time; which is to this Day moſt Punctually Obſerv'd. The *Boſtangi Baſhi*, who has the command of all the *Agiamoglans* in the *Seraglio*, the *Topgi Baſhi*, or ſuch Great Officers, attended with a great Train of Armed Men, walking the Rounds, and Drubbing ſuch as they find abroad at unſeaſonable Hours of what Nation or Quality ſoever, except *Phyſicians*, *Surgeons*, and *Apothecaries*, whom they Allow to Viſit the Sick.

The *Turkmans*, (for ſo they are Peculiarly call'd, as if they were the True Deſcendents of the *Old Turks*, or *Scythians*,) have no Fixt Reſidence any where, but Travel with their Families and Cattel from place to place, carrying their Wives and Children upon Camels. They Pitch their Tents uſually near Rivers and Fountains, for the convenience of Water, and ac-

cording as their Neceſſities require, make a Longer, or a Shorter Stay. Their whole Eſtate conſiſts in their Numerous Flocks and Herds, which they Sell upon occaſion to ſupply themſelves with what they want, at the Towns they paſs by. Their only Concern is how to Enjoy the Benefits and Bleſſings of Nature, without the Troubles and Turmoyls and Diſquiets of Life: being Contented and Happy in one another's Company; Void of all Ambition and Envy; Courteous and Humane to Strangers, that may want their Help and Aſſiſtance, kindly entertaining them with ſuch Proviſion as their Folds afford. The Country lies open without any Incloſures, and the Propriety not being Veſted in any one, they Travel through the Plains Unmoleſted, and find excellent Paſturage every where. The *Turks* Till no more Ground than will ſerve their Neceſſities: being ſupply'd with *Corn* from *Ægypt*, and from *Moldavia* and *Walachia*, by the way of the *Black-Sea*; letting vaſt Tracts of Ground lie Waſte and Uncultivated: So that their Sloth herein ſometimes is juſtly Puniſh'd with Dearths.

They have nothing to *Shew* for their *Houſes* and *Poſſeſſions*, but an *Hogiet*, or piece of Paper ſubſcrib'd by the *Cadi*, if they have Acquired them by their Money, or that they were their Father's before them.

The *Derviſes* generally are Melancholy: and place the greateſt part of their Religion in *Abſtinence* and other Severities. Some Cut their Fleſh, others Vow not to Speak for 6 or 7 Years, or all their Lives long, tho' never ſo much Provok'd or Diſtreſſed. Their Garments are made of a Courſe ſort of Wool, or Goats Hair. They are ty'd up by the Vow of their Order ever from Marrying. Several of this *Sect*, in the Heighth of their Religious Phrenzy, have Attempted upon the Lives of the *Emperors* themſelves, (at whoſe Government they have taken Diſguſt) as *Mahomet* the 2*d*. and *Achmet*, as if ſuch Deſperate Attempts were Fatal to *Bigots* in all Religions.

They pay a mighty Veneration to any *Relique* of *Mahomet*, his *Banner* is ſtill Preſerv'd in the Treaſury of the *Seraglio*, and is lookt upon as the great Security of the Empire. They believe that it was ſent from Heaven, and Convey'd into the Hands of *Mahomet*, by the *Angel Gabriel*, as a Pledge and Sign of Succeſs and Victory in his Battels againſt the *Chriſtians*, and all other Enemies of the *Muſſulman Faith*. It was ſent to *Candia* to Encourage the Soldiers to endure the Fatigue of that Long and Tedious Siege; and when it was brought thence, after the Surrendry of the City, to be Depoſited in its uſual place, the *Vizir* gave ſeveral *Chriſtian Slaves*, that Row'd in the Gally that was Fraught with this Holy Ware, their Liberty. They pretend to have ſome Rags of *Mahomet's Veſt*, to which they aſcribe great Vertue. In Confidence of which, the Emperor *Achmet*, in the Time of a great Fire, which Rag'd at *Conſtantinople*, when all other Means Fail'd, Dipt part of them in Water to be Sprinkled upon the Fire, to Rebate the Fury of it.

Next to the *Mufti*, or *Cadaleskires*, are the *Molla's*; of which theſe *four* are the chiefeſt in Dignity; The *Molla* of *Gallata*, *Adrianople*, *Aleppo*, *Pruſa*; and after them are reckon'd theſe 8, *Stambol*, *Ephendi*, *Lariſſa*, *Miſir*,

Miſir or *Cairo*, *Sham* or *Damaſcus*, *Diarbekir* or *Meſopotamia*, *Cutaia*, *Sophia*, *Philippi*.

The *Prieſts* have no Habit Peculiar to their Profeſſion, whereby they are Diſtinguiſh'd from others. If they are put from their *Moſchs* for Miſcarriage, or Neglect of doing their Duty, or if they think fit to Reſign and be *Prieſts* no Longer, they may betake themſelves without any Scandal to *Secular* Employments; their former Character and Quality wholly Ceaſing. While they remain *Prieſts*, they Counterfeit a more than ordinary Gravity in their Diſcourſe and Walking: and Affect to wear *Turbants* Swelling out, and made up with more Croſs Folds; which was all the Difference I could obſerve by their Head Attire, which is various, though I could not find that this was Conſtantly and ſtrictly Obſerved.

In *Byram Time*, which is the great Feſtival of the Year, at which Time every one looks Cheerfully and Merrily, among other Signs of Mutual Reſpect, they Beſprinkle one another with ſweet Water; They Indulge to ſeveral ſports; and ſome are mightily Pleaſed with Swinging in the open Air, the Ordinary ſort of People eſpecially, paying only a few *Aſpers* for the Diverſion.

The *Government* is perfectly Arbitrary and Deſpoticall; the Will and Pleaſure of the *Emperor* having the Force and Power of a Law, and often times is above it. His bare *Command*, without any *Proceſs*, is enough to take off the Head of any Perſon, (tho' never ſo Eminent in Dignity: tho' uſually for Formality and to ſilence the Murmurings of the Soldiery and People, the Sentence is Confirm'd by the *Muffti.*) Sometimes *Baſſa*'s, who have amaſs'd great Treaſures in their Governments, are Cut off in their own Houſes in the midſt of their Retinue, the Meſſengers of Death producing the *Imperial Command*, uſually ſent in a Black Purſe, and not a Sword drawn in their Defence. Others, if they are Obnoxious to the leaſt Umbrage or Jealouſie, tho' Diſmiſt the *Seraglio* with all poſſible Demonſtrations of the *Grand Signor*'s Favour, and with Rich Preſents in order to take Poſſeſſion of Places of great Command in the Empire, before they have got 2. or 3. days Journey from *Conſtantinople*, have been Overtaken and ſtrangled. In the Army Commands are given according to Merit: Courage, and Conduct are ſure to be Rewarded, the way lying open to the Meaneſt Soldier to Raiſe himſelf to be the Chief of his Order. But other Preferments depend upon meer Chance, and upon the fancy of the Emperor, whether the Perſon be fit or no, and they are as ſoon Loſt. The leaſt ill Succeſs or Miſcarriage, proves often times Fatal, and a more Lucky Man is put in his Place, and he Succeeded by a third, if Unfortunate in a Deſign, tho' managed with never ſo much Prudence and Valour. They admit of no *Hereditary Honours*, and have no Reſpect to *Deſcent* or *Blood*, except the *Ottoman Family*: He only is Great and Noble, whom the *Emperor* favours, and while his Command Laſts. According to a Tradition, that paſſes Current amongſt them, a *Baſſa*'s *Son*, by a *Sultana*, or a *Daughter* or a *Siſter* of the *Emperor*, can Riſe no Higher than to be a *Sangiacbei*, or Governour of ſome Little Province, much Inferior to a *Baſſa* and under his Juriſdiction.

Juriſdiction. Being born of *Slaves*, for the moſt part, they do not Pride themſelves in their Birth, very few among them being ſcarce able to give any account of their Grandfathers. They have no *Sirnames*, but are Diſtinguiſhed by their Poſſeſſions and Places of abode: and Enjoying by Law a Liberty of having what Women they pleaſe, they have little or no Regard to Alliance or Kindred.

Their *Empire* owes the Continuance of its being, to the Severity of the Government, which oftentimes takes place without Regard either to Juſtice or Equity; and to their frequent Wars, which prevent all occaſions of Mutiny and Faction among the Souldiers, which happen frequently when Unimploy'd. So that tho' Ambition may put a Warlike *Sultan* upon Enlarging his Territories by New Conqueſts, yet Reaſon of State forces a Weak and Effeminate Prince, ſuch as was *Ibrahim* to make War for his own Security. Their *Politicks* are not owing to Books and Study, and the Examples of Paſt Times: but to Experience and the plain Suggeſtions of Nature and Common Senſe. Their *Councils* formerly were Open, and their Deſigns Known and Proclaimed before-hand, as if this had been a Bravery becoming their Greatneſs; and that they ſcorned to ſteal a Conqueſt. But they have learn ſince the Art of *Diſſimulation*, and can Lye and Swear for their Intereſt, and ſeem Exceſſive in their Careſſes to the Miniſters of thoſe Countries which they intend to Invade. But their Preparations for *Arming* are made with ſo much Noiſe, that an Ordinary Jealouſie is ſoon awaken'd by it to Oppoſe them, in caſe of an Attaque. They ſeldom or never care to have War at both the Extremes of the Empire at the ſame Time: and therefore they are mighty ſolicitous to ſecure a Peace with *Chriſtendome*, when they Intend a War upon the *Perſian*. And as much as is poſſible, they Avoid Quarrelling with *Two Chriſtian Princes* at Once: being uſually at League either with *Poland* or *Muſcovy*, when they War upon *Hungary*, and ſo on the contrary; Dreading nothing more, than an Union of the *Chriſtian* Princes, Bordering upon them, which would prove ſo Fatal to their Empire, and quickly put a Period to their Greatneſs. For hereby they would be put upon a Neceſſity of making a *Defenſive War* to their great Loſs and Diſadvantage: and at laſt either be Forced to Beg a Peace of the *Chriſtians*, or Run the hazard of loſing all by a further Proſecution of the War. This they are very ſenſible of: and therefore as they take all Occaſion to promote Quarrels and Diſſentions in *Hungary* and *Tranſylvania*, ſo they greatly rejoyce when the Princes of *Chriſtendom* are at War one with another. This is their great time of advantage, and they know that it is their true Intereſt to Purſue it tho' they do not always, by reaſon of the Ill Condition of their own Affairs, make uſe of it. During the *Civil Wars* of *Germany*, the *Baſſas* and other Commanders of the Army, were very Importunate with the *Grand Signior* tomake a War on that ſide, and to enlarge his Conqueſts as far as *Vienna*: no Conjuncture having been ever ſo Favourable to Conſummate ſuch a Deſign, in which *Solyman* ſo Unhappily Miſcarry'd They promiſed him an eaſy Victory, Aſſuring him that the Animoſities of the Princes of the Empire were ſo Heightened, that there was no room left for a Reconciliation; that he was but to go at the Head of an Army to take Poſ-

ſeſſion,

ſeſſion, and that *Auſtria* would Surrender at the firſt News of his March towards it. The *Emperor* was not to be Mov'd at that time by theſe Inſinuations and Plauſible Diſcourſes; being continually Urg'd, he as often Deny'd. One Day when they came to renew their Advice about the *German* War, he having given Order before, that ſeveral Dogs ſhould be kept for ſome Days without Meat, commanded that they ſhould be brought out being almoſt Starv'd, and Meat thrown among them; whereupon they Snarl'd and Bit one another: in the midſt of their Noiſe and Fighting, he caus'd a Bear to be let looſe in the ſame Area; the Dogs forgetting their Meat, and leaving off their Fighting, Ran all upon the Bear, ready to Prey upon them Singly, and at laſt Kill'd him. This Diverſion the *Emperor* gave his *Baſſa's*: and left them to make the Application.

A certain *Prophecy*, of no ſmall Authority, runs in the Minds of all the People, and has gain'd great Credit and Belief among them, That their Empire ſhall be Ruin'd by a Northern Nation which has White and Yellowiſh Hair. The Interpretation is as Various as their Fancy. Some Fix this Character on the *Muſcovites*: and the Poor *Greeks* Flatter themſelves with Fooliſh Hopes, that They are to be Their Deliverers, and to Reſcue them from their Slavery; chiefly becauſe they are of their Communion, and owe their Converſion to the *Chriſtian Faith* to the Piety and Zeal of the *Grecian Biſhops* formerly. Others look upon the *Swedes*, as the Perſons Deſcrib'd in the *Prophecy*, whom they are moſt to Fear. The Ground and Original of this Fancy, I ſuppoſe, is owing to the great Opinion which they have of the Valour and Courage of that Warlike Nation. The great Victories of the *Swedes* in *Germany* under *Guſtavus Adolphus* were loudly Proclaim'd at *Conſtantinople*, as if there were no withſtanding the Shock and Fury of their Arms: and their continu'd Succeſſes Confirm'd the *Turks* in their firſt Belief, and their Fears and their Jealouſies were augmented afterwards, when *Charles Guſtave*, a Prince of as Heroick a Courage and as great Abilities in the Art and Management of War as the Juſtly Admired *Guſtavus*, enter'd *Poland* with his Army, and carry'd all before him; Seiz'd on *Warſaw* and Drove *Caſimire* out of his Kingdom; and had almoſt made an Entire and Abſolute Conqueſt, only a Few Places holding out. This Alarm'd the *Grand Signor* and the *Baſſa's* of the *Port*, as if the *Prophecy* were then about to be Fulfill'd; who did not care for the Company of ſuch Troubleſome Neighbours, who might Puſh on their Victories, and Joyning with the *Coſſacks* Advance their Arms further, and make their Country the Seat of War which might draw after it Fatal Conſequences. To Prevent which Couriers were Diſpatch'd from *Conſtantinople* to *Ragotski*, Prince of *Tranſylvania*, then in Concert with the *Swedes*, to Command him to Retire with his Army out of *Poland*, as he Valu'd the Peace and Quiet of his own Country, and the Friendſhip of the *Grand Signor*, whoſe Tributary he was, and by whoſe Favour he had gain'd that Principality. And the *Crim-Tartars*, the Sworn Enemies of the *Poles*, who at that time lay Heavy upon them, were wrought upon by the ſame Motives and Reaſons of State, to Clap up a Peace with them: that being Freed from theſe Diſtractions,

ſtractions, they might Unite their Forces the better together, and make Head againſt the *Swedes*.

The *Ambaſſadors* of *Chriſtian Princes*, when they are Admitted by the *Grand Signor* to an *Audience*, (their *Preſents* being then of courſe made, which are look'd upon as Due, not to ſay as an Homage) are Diſmiſt in Few Words, and Referred by Him to his *Wakil*, or Deputy, as he uſuall ſtyles the *Chief Vizir*: and a Small Number of their Retinue only Permitted the Honour of *Kiſſing his Veſt*, and then Rudely enough ſent away.

The *Grand Signors* keep up the State of the *Old Aſiatick Princes*: They do not Expoſe themſelves Often to the View of the People, unleſs when they Ride in Triumph, or upon ſome ſuch Solemn Occaſion; When they go to the *Moſchs*, or Divert themſelves in the Fields, either in Riding or Hunting, they do not love to be Stared upon, or Approached; It is Highly Criminal to Pry into their Sports, ſuch an Inſolent Curioſity being often Puniſhed with Death. The Story is Famous of *Morad* the 3d. who Baiting a Bear in the *Old Palace* with a Maſtiff, and eſpying 3 Fellows upon the Tower of *Bajazid's Moſch*, who had planted themſelves to ſee the Sport, commanded their Heads to be ſtruck off immediately, and to be Brought before him, which was done accordingly. Inſtances of ſuch *Capricio's* are Frequent in the *Turkiſh* Hiſtory; this following happened during My ſtay at *Conſtantinople*.

Upon the Return of *Vizir Achmet* from *Candia*, after the Surrendry of that City, and a Happy End put by him to that Tedious and Bloody War, He acquainting the Preſent Emperor, then at *Adrianople*, with the Hiſtory of that Famous Seige at large, made ſuch Terrible Repreſentations of their and the *Venetians* Mining and Countermining one another, that the Emperor was Reſolved out of Curioſity to ſee the Experiment made of a thing that ſeem'd to him almoſt Incredible. A Work was ſoon Raiſed and Undermined, and above 30 Murderers, and Robbers upon the High-Way, and ſuch like Villains, were put into it, as it were to Defend it. The *Grand Signor* ſtood upon an Eminence at ſome Conſiderable Diſtance, expecting the Iſſue of it; upon a Signal given, the Mine was Sprung, and the Fort Demoliſhed, and the Poor Wretches torn piece-meal to his great Satisfaction and Amazement.

The *Moon* is the Auſpicious Planet of the *Turks*: according to the Courſe of which they Celebrate their *Feſtivals*. They begin their *Months* from the Firſt *Appearance* of it, at which time they Chooſe, except a Delay brings a great Prejudice and Inconvenience with it, to Begin their Great Actions. The *Creſcent* is the *Enſign* of the *Empire*, which they Paint in their Banners, and Place upon the Spires of their *Moſchs*. Next to the Day of the *Appearing Moon*, they pitch upon *Friday*, to Fight upon, to Begin a Journey, and eſpecially their Pilgrimage toward *Mecca*, or to do any thing of great Conſequence, as very Lucky and Fortunate.

XL. 1. *July* 18. 1678. At 5. in the Morning, we ſet out from *Aleppo*, being 16 *Engliſh*; but with Servants and Mulettiers in all 40; and in 4 *Hours* and an *half*, Travelling South by Eaſt, we arrived at a Village call'd *Caſſerabite*, being at the Edge of the *Deſart*.

A Voyage of ſome Engliſh Merchants *at* Aleppo, *to* Tadmore; *by Mr.* Tim. Lanoy *and Mr.* Aaron Goodyear. n. 118. p. 129.

19. We roſe at One in the Morning, and directed our Courſe S. S. E. over the *Deſart*, for a Fountain call'd *Churraick*; but our Guide loſing his way, there being no Path, 'twas near Noon before we found it. The Water is of a *Purgative* Quality. In our way we found two *Arabs* with two Aſſes, one whereof carried *Water* and a little *Bread*, the other they Rode on by turns; they had One Gun wherewith they ſhot *Gazels*, the *Bullet* being a hard ſtone broken round and caſed with Lead; they had on the Palms of their Hands, Elbows, Knees and Feet, ſome Gazel-Skin tied, that they might be able to Creep the better on the Ground, to ſhoot; one of the Aſſes walking by as a Stalking Horſe, and the *Arab* imitating the Cry of the *Gazel* till he gets within ſhot. Theſe *Arabs* are call'd *Selebee*. At the *Well* came to us ſome *Arabs* that were making *Aſhes* of the ordinary ſort of Weeds call'd *Chuddraiſe*, *Ruggot*, and *Cuttaff*; theſe they Cut and Dry, and putting them into a Pit, ſet Fire to them, and the *Aſhes* Cake at the bottom. The *Aſhes* they carry to *Eglib* and *Tripoli*, to make *Soap* of: But the beſt ſort of *Aſhes* are made of the Weed *Shinon*, which grows about *Tadmor*, *Soukney*, *Tibe* and *Tarecca*; it grows like *Broom* in *England*, and in ſhape reſembles *Coral*.

20. We roſe at 4 in the Morning, and Travelling 2 *Hours* E. S. E. we arriv'd at *Andrene*, where we found the *Ruins* of 2 or 3 *Churches*, and of a *Great Town* lying in a large Plain; where having taken ſome Fragments of *Greek Inſcriptions*, which afforded no certain Senſe, but yet were Evidently *Chriſtian*, we marched again S. b. E. and in about 4 *Hours* time came to a pleaſant *Aqueduct* call'd *Sheck-alal*; this *Aqueduct* is Cut through the main Rock, for a great way from the Mountains; and where it Ends, the *Arabs* have made a *Garden*, which afforded us *Melons*, *Cucumbers*, *Purſlain*, &c. In a *Grott* hard by, there dwelt an *Arab* with his Family; he had a Dozen *Buffalo's* which they uſed both for their Milk, and to Plow the Ground, Sowing both *Wheat* and *Barley*: hither the *Arabs* reſort, when they have committed any Robbery about *Aleppo*, or *Hama*, and here they Repoſe and Divide the Spoil.

21. We roſe at 4 in the Morning, and riding 2 *Hours* South, we came to a *Ruin* call'd *Briadeen*; here we found the following *Inſcription* on a Stone, good part in the Ground:

ΑΦΙΕΡωΘΗ ΑΑΙΑΥΝΔΙΟΥ ΤΟΥ ΑΜΦ ЄΤΟΥϹ
ΔΙΑ ΜΑΤЄΡΝΟΥ ΚΑ (ΙΠ) ΑΠΠΟΥ ΚΑΙ ΜΑΙΚΟΥ ΚΝЄΤΜΝ
——Υ——N

From hence going S. E. in 4 *Hours* more we came to a *Well* call'd *Coſtall* (which ſignifies a *Spring* in *Arab.*) Moſt part of our way through the *Deſart* we were troubled with *Rat-holes* in great Numbers, like *Coney-*

boroughs, which by the ſinking in of the Earth, very much incommoded our Horſes and Mules. Theſe *Rats* have at their Tails a Buſh of *Hair*, and the *Arabs* eat them all, excepting one part. From this *Well* we aroſe about 4 in the Afternoon, and began to Aſcend ſmall *Hills* cover'd with Trees, which for the moſt part, were the ſmall *Piſtacho's* which the *Arabs* pickle with Salt; but eaten Green are good to quench Thirſt. We Travell'd 3 *Hours* up the *Hills*, where we Pitcht that Night, having no other *Water* but what we carry'd with us; and at Night we had a ſmall Shower of *Rain*, a thing Unuſual in that Country at that Time of the Year.

22. We roſe by 2 in the Morning, and Travelling E. S. E. we came by 11 to a *Well* call'd *G'hor*.

23. We roſe by *one* in the Morning, and Travelling moſt Eaſt, we came to a large Plain, where we ſaw before us, on a high Mountain, a great *Caſtle*, call'd by the *Arabs Anture*. When we had Travell'd 2 or 3 *Hours* in this Plain, we eſpy'd an *Arab* driving towards us on a *Camel* with his *Launce*, ſo faſt, that he came on a round Gallop, and we ſuppos'd him ſent as a *Spy*: being come up to us, he told us he was of *Tadmor*, and that his *Prince*, the *Emir Melkam* had that Day made Friendſhip with *Hamet Shideed* another *Prince*, and that together they had had 400 Men; ſo he kept us Company an *Hour* or *two*, and enquired of our Mulettiers if we were not *Turks* Diſguis'd, with intent to ſeize on *Melkam*; for we Travell'd with a *Bandiero*, the Impreſs being a *Hanjarr* or *Turkiſh Dagger* and a *Half Moon*. We told him we were *Franks*, which he could hardly Believe, wondering that we Travell'd thus in the *Deſart*, only out of *Curioſity*. Being come near to *Tadmor*, he went a little before us, and on a ſudden run full ſpeed towards the *Ruins*, we not endeavouring to Hinder him. Our Guide told us he was gone to acquaint the *Arabs*, who we were, and that we ought to Suſpect and Prepare for the worſt; ſo we diſmounted 20 of our Servants, each having a *Long Gun*, and *Piſtols* at his Girdle, and placed them a-breaſt before us: we following at a little diſtance behind, on Horſeback with *Carabines* and *Piſtols*. In this order we proceeded, and came to a moſt Stately *Aqueduct* which runs under Ground in a direct Paſſage 5 *Miles*, and is cover'd with an Arch of *Baſtard Marble* all the way, and a Path on both ſides the *Channel* for 2 Perſons to Walk a-breaſt; the *Channel* it ſelf being about an *Engliſh Yard* in Breadth, and $\frac{3}{4}$ of a *Yard* in Depth. At 20 *Yards* Diſtance all the Way are *Ventiducts* for the Air to paſs, and the *Holes* are ſurrounded with ſmall *Mounts* of *Earth* to keep the Sand and Duſt from falling down. We march'd cloſe by theſe *Mounts*, which might ſerve us for Defence, expecting every Moment that the *Arabs* would come to Aſſail us, having the diſadvantage of the Sun and the Wind in our Faces: wherefore we Travelled hard to gain an Eminence where we might poſt our ſelves advantagiouſly, and ſtop and repoſe a little, to conſider what we had to do. The *Arabs* finding us to come on with this Order and Reſolution, thought not fit to adventure on us, ſo we gain'd the Hill, from whence we might diſcern theſe *Vaſt* and *Noble Ruins*, having a Plain, like a Sea for greatneſs, to the Southwards of it. Here having refreſht our Men, we fetch'd a little

Compaſs

Compaſs and Deſcended by the Foot of a Mountain, on which ſtands a great *Caſtle*, but uninhabited. Here two *Arabs* came to us with *Lances*, one being *Chiab* to *Melkam*, and we ſent two to meet them; they gave the *Salam Alika*, and ours return'd the *Alica Salam*, and advancing to our Company, told us, the *Emir* had underſtood of our Coming, and had ſent them to acquaint us that He was our Friend, and that all the Country was ours. We ſent back with them our *Janizary* and a Servant to Viſit the *Prince* in his Tents, which were in a Garden. In the mean time we Diſmounted at a Watering place amidſt the *Ruins*, but did not unload till our *Janizary* and Servant return'd with the *Emir's Teſcarr*, aſſuring us of a Friendſhip and Protection, a Writing which the *Arabs* were never known to Violate before. With them came alſo one that belong'd to the *Sheck* of the Town, for whom we had Letters from *Uſeffe Aga* the *Emeen* of *Aleppo*. He deſir'd us for greater Security to pitch our Tents under the Town-Walls, which is in the *Ruins* of a *Great Palace*, the Wall yet ſtanding very High, the Town within but ſmall, and the Houſes, excepting 2 or 3, no better than Hogſtyes. So we Pitch'd in a Deep Sandy Ground, where we found it exceeding Hot. Here we waited till 3 of the Clock without Eating any thing, expecting the *Sheck* ſhould have Preſented us, according to the uſual Cuſtom of the *Turks* to their Friends, and have given ſome anſwer to the *Letters* we brought him; but on the contrary we found by the Geſtures of the People, that we had reaſon to ſuſpect them. Hereupon 2 of our Company believing that the want of a Preſent to the *Emir* was the Cauſe thereof, reſolv'd to adventure to give him a Viſit, and taking the *Janizary* and one Servant, they carry'd him a Preſent of 2 Pieces of *Red Cloth*, and 4 of *Green*, and ſeveral other things. Being come, he welcom'd them into his Tent, and plac'd the one on his Right hand and the other on his Left. *Melkam* was a young Man, not above 25, and well Featur'd and a moſt excellent Horſeman; *Hamet Shideed* the other *Prince* was more Elderly, as about 40 Years of Age, and was not in the Tent, but ſate under a Palm-tree near it. He treated them with *Coffee*, *Camel's Fleſh* and *Dates*, and enquir'd of their Journey and the Cauſe of their coming: They told him, it was only Curioſity to ſee thoſe *Ruins*; he ſaid that formerly *Solomon Ibn el Doud* built a City in that place, which being Deſtroy'd, was built again by a Strange People, and he believ'd that we underſtanding the *Writing* on the *Pillars* came to ſeek after *Treaſure*, he having but 6 *Moons* before found a Pot of *Corra Cruſſes*. After this he went out af the *Tent*, leaving them Smoaking *Tobacco*, to the *Janizary* and Servant, and told them, that never till that Day any *Franks* had been at that Place, and that now we knew the way through the *Deſart*, we might inform the *Turks* to their Ruin and Deſtruction, ſo that it would be Convenient for them to Deſtroy us all: but that we coming as Friends, he would only have 4000 *Dollars* as a Preſent, elſe he would Hang them and the two *Franks* up, and go Fight the reſt. This Meſſage being brought them, they anſwered, they could ſay nothing to that Demand, not knowing our Minds: but if he would permit them to go and ſpeak with the reſt, they would re-

turn an Anſwer. Hearing this, he threatn'd preſent Death: but at length gave leave to our *Janizary* to carry us a Letter from them, wherein they ſhew'd the Danger they were in, and earneſtly entreated us to Redeem them, the Price ſet upon them being 2000 *Dollars*; one half in Mony, the other half in Goods, as *Swords*, *Cloaths*, *Tents*, &c, which the *Emir* promiſed to Eſtimate at their worth.

Upon the Receipt of this Lerter we begun to examine what *Monies* we had, *Cloaths*, and other *Trade*, and found that we could not near make up that Sum. In this Confuſion came two *Arabs* to receive the things, and immediately word was brought that the *Emir* would come and Viſit us: we ſent him word, that if he came with more than 2 Followers, we would not admit him. So he came with 2 Servants only: and in Concluſion, we made him up in *Money* and *Goods* to the Value of 1500 *Dollars*; he Valuing our things as we pleaſed, his Deſign being not ſo much to compleat the Sum, as to take from us all we had.

After this, about Sun-Set he Return'd us our 2 Friends. We kept good Watch in the Night, and the next Day we Return'd by the ſame way we Came, and arriv'd at *Aleppo Jul.* 29. in the Morning.

This and other the like Violences us'd by this *Arab Prince*, made the *Baſſa* of *Aleppo* reſolve to Deſtroy him; and not long after he Cajoll'd him with the Hopes of being made *King* of the *Arabs*, and to Draw him near the City, he *Veſted* and Careſs'd ſome of his Followers; which having its Effect, the *Baſſa* ſurpriz'd him in his *Tents* by Night, and ſoon after he was put to Death. This thoſe people were willing to believe the Effect of their ſo Abuſing the *Engliſh*, and might much Contribute to the Security and Good Uſage they found that went the *Second* time on this Expedition.

We had not time to view theſe *Ruins* by reaſon of this Uſage, though perhaps we might with Safety. We took only One of the *Inſcriptions* as we paſt by; which was thus,

ϹЄΠΤΙΜΙΟΝ ΟΥΟΡΟΔΗΝ ΤΟΝ ΚΡΑΤΙϹΤΟΝ
ЄΠΙΤΡΟΠΟΝ ϹЄΒΑϹΤΟΥ ΔΟΥΚΗΝΑΡΙΟΝ
ΚΑΙ ΑΡ.. ΑΠΗΤΗΝ ΙΟΥΛΙΟϹ ΑΥΡΗΛΙΟϹ ϹΑΝΙΜΗϹ
ΜΑϹϹΙΑΝΟΥ ΤΟΥ Μ..ΑЄΝΑΙΟΥ ΙΠΠЄΥϹ
ΡΟΥΜΑΩΝ ΤΟΝ ΦΙΛΟΝ ΚΑΙ ΠΡΟϹΤΑΤΗΝ
ЄΤΟΥϹ ΗΟΦ ΜΗΝЄΙ ΞΑΝΔΙΚΩ.

As far as we could Conclude from our Journeys, and the Poſition of the ways taken by two good *Compaſſes*, the Diſtance of *Tadmor* from *Aleppo* is about 150 *Engliſh Miles*, and the *Courſe* S. S. E. or rather ſomewhat more *Southerly*, conſidering the *Variation* of the *Compaſs* which is above *half* a *Point Weſtward* in theſe Parts.

A Second Voyage to Tadmor; by..... Communicated by Mr. Tim. Lanoy and Mr. Aaron Goodyear ib. p. 338.

2. We ſet out from *Aleppo* for *Tadmor*, on *Michaelmas-day* 1691. being in all, Maſters and Servants 30. Men, well Armed, having obtained a promiſe of ſecurity from *Aſſyne* then *King* of the *Arabs*, and one of his own

People

People for a Guide. This Day our Road pointed *S. by E.* and in 4 *Hours* we came to a Fountain call'd *Chaphir-Abiad*, leaving *Old Aleppo* about an *Hour* Distant on the Right hand. Here we made but a very short stay: but proceeded to a better *Fountain* at the Foot of a very High Hill, covered with Loose Stones, the *Ruins* of a Village call'd *Broeder*, of which there was not one House remaining, and Dining here, we advanced in an *Hour* and a *quarter*, through a Fertile open Plain, to a place call'd *Emghir*; famous for the best *Wheat* that is brought to *Aleppo*. This we made our first Stage; and mounting again in the Morning about 5. a Clock, in less than an *Hour*, we past by an Uninhabited Village called *Urghee* our Road Pointing as before, through the Fruitful Plain, Even and Pleasant: but when we came to ascend the Hills, where I reckoned we entred the *Desart*, we had a troublesome Passage, over loose Great Stones, without any Appearance of a Road.

Our Guide had promised to Conduct us through Pleasant *Groves* and *Forrests*; but no such thing appeared, unless we should bestow that Name upon Low withered *Shrubs* that grew in the way; only one *Tree*, we saw, which was of good use to us, serving as a Landmark, and when we were come up with it, being left at a little distance on the Right hand, we gained the prospect of a Remote Ridge of Hills before us, and on the top of one of them an old Castle, known by the name of *Gazar Ibn Wordan*. I soon turn'd my Eyes from it, to a little Round hill, more on the Left, by which we were to Direct our Course, and about a *quarter* of an *Hour* from which stood a *Sheck's House*, call'd *Sheck Ailha*, with a Well of *Water* by it; but such that we had but little Gusto to Taste, though it served our Horses. All the Country hereabouts is stored with *Gazels*, and there is a sort of Barbarous People there, that have hardly any thing else to Live upon, but what of these they can Kill; and Necessity has taught them to be no mean Artists in their way. That Morning we had Travelled about 5 *Hours* to reach Sheck *Ailha's*; yet finding nothing to invite our stay there, (though there were 4 or 5. *Tombs* not ill made, according to the *Turkish* Mode) about One of the Clock we Mounted again, bending to the *South East* or something more *Easterly*. In our way we had a Remarkable Prospect, on the Right Hand, of the *Ruins* of an Ancient City call'd *Andren*, and sometimes *Londrine*, which we were told had been formerly inhabited by *Franks*, and that there were many *Inscriptions* there. We proceeded till Sunset, very Weary, and almost without hope of coming to Water that Night, though at the same time near Dead for thirst: and in an Hour's time more our Guide brought us to the side of a *Bog*, call'd by the Name of *Zerga*, where we found *Water* enough, but it was neither Palatable nor Wholesome, neither did the Ground seem proper to Sleep upon; yet we were forced to be Content, there being no removing thence that Night.

Oct. 1. We Departed from *Zerga*, about 2 *Hours* before Sun-rise, and as soon as 'twas Light, had the Prospect of a very High Hill: To this we made as directly as we could look, finding nothing in our way Observable except a multitude of *Holes* made in the Sandy Earth, by *Rats*, *Serpents* and other Animals, which render'd our Riding a little Troublesome; as we had

had found it upon the ſame Account the Afternoon before. About 2 *Hours* ſhort of our Stage, we were ſhewn 3 Little Round Hills, lying to the Right in a Direct Line, known by the Name of *Tenage*; where we were told there was Good *Water*, and it's for that reaſon only they deſerve the Notice of thoſe that Travel through ſuch a Thirſty *Deſart*. The Place, to which we directed our Courſe, was call'd *Eſree*, where we arrived about 11 a Clock, and found to our Great ſatisfaction Excellent Water. Here we could diſcern the *Foundations* of a Spacious *City*, and a piece of a Thick Wall, built of Chalky Stone was ſtanding: this we judged to be the *Remainder* of a *Caſtle* ſituated on the ſide of the Hill, ſo as both to Defend and Command the City. On the Top of the Hill, above the *Caſtle*, ſtands the *Ruins* of a Fabrick, in appearance very Ancient, built of a very Hard Stone, yet exceedingly worn by the Weather. Tis of an Oblong Figure, Pointing near to the N. E. and S. W. with only One Door on the *Eaſterly* End, which was once Adorned with extraordinary good *Carvings*, of which there are ſtill ſome Remains: but the greateſt part is either worn away, or purpoſely Defaced; and thoſe Marks of Ancient Beauty that Remain are Obſcure, and Difficultly Diſcernable.

The Outſide of the Walls is Beautified with *Pillaſters* quite round, with their *Pedeſtals* and *Capitals* Regular and Handſom: but the *Roof* is fallen down, and within appears nothing which looks either great or Beautiful. The Situation, and Placing the Door, hinders one from Conjecturing it to have been a *Chriſtian Oratory*, or *Chapel*, and therefore in probability it muſt have been a *Heathen Temple*, and if ſo, then the Piece of the *Caſtle-Wall* being of a ſofter Stone, muſt be much more Modern. The Goodneſs of the *Water* brings the *Arabs* (who Rove up and down the *Deſart*) and the *Turkmen* frequently hither: which has occaſioned a great many *Graves* about the Temple; and ſome have had Leiſure, and (which is more difficult to be Imagined) Skill enough to ſcratch in the *Walls* the firſt Letters of their Names, and many more in *Arabick Characters*, which we could make nothing of, no more than of an *Arabick Inſcription* which lay hard by, but appeared not Ancient.

Oct. 2. We departed from *Eſree*, about an *Hour* and an *half* after *Midnight*, and in 6 *Hours* and an *half* arrived at *Two Wells*, the *Water* 18 Fathom and 2. Foot Deep, known by the Name of *Imp Malcha Giub*. Through the greateſt part of this Stage, we had a broad Beaten Road, and where that was not Diſcernible we guided our ſelves by a Ridge of *Chalky* Hills, under which the *Wells* lay. The *Water* we found exceeding Bad, and of ſo Noiſom a Scent, that we could not endure it ſo much as at our Noſes.

In our way Hither we were ſhewn the true *Plant* which they Burn for *Soap-Aſhes*, which has no *Leaves*, but a Soft Juicy *Stalk*, ſhooting into ſeveral Branches, and ſomething reſembling our *Samphire*, only 'tis more Round than that. The *Aſhes* likewiſe we ſaw, which were made not far from the *Wells*, which in Burning Run into *Cakes*, not much unlike the *Cinders* of a *Forge*, only they are *Heavier*, and not ſo full of *Pores* nor ſo *Hard* as

they

they are. In the Afternoon we proceeded on our Voyage 2 *Hours* and an *half*, to a place call'd *Almyrrha*, paſſing rather between, than over the Hills, tho' we had ſomething of an Aſcent too. Our Journey hitherto had been altogether *Southerly*, and but little varying to the *Eaſtward* of Due *South*,

Oct. 3. We mounted from *Almyrrha* between 5 and 6 in the Morning, making to the Point of a high Ridge of Mountains, through an Uneven *Deſart* way: we came to the Aſcent after about 4 *hours* Travel which we found not difficult; and when we were on the top, we had a Pleaſant Proſpect of the Country. This Mountain was Covered on both ſides with great plenty of *Turpentine-Trees*, which was an Object very Pleaſing, having ſeen very few *Greens* in our whole Journey. This *Tree* grows very Thick and Shady, and ſeveral of them we ſaw loaded with a vaſt abundance of a ſmall Round *Nutt*, the chief uſe whereof is to make *Oil*; though ſome Eat them, and account them as great a *Regalio* as *Piſtaches*. Their outward Husk is Green, and more Oily than that of *Piſtaches*, and within a very Thin Shell a Kernel both in Colour and Reliſh very much reſembling them: but thoſe that Eat them, ſeldom take the pains to ſearch for the Kernels, but eat Husk and Shell all together, which have no Ungrateful Taſte. From this Hill we had a tedious Deſcent, and coming at the foot into a narrow Gut, winding this way and that between the Mountains, our Paſſage ſeem'd very long, Hot, and Tireſome: our Want of *Water* however obliged us to proceed, whereof we now began to be in great Neceſſity, eſpecially for our Horſes and Mules, who had none the Night before, nor none at all that day.

About 2 of the Clock in the Afternoon a Small Drizling *Rain*, which we had about half an hour, increas'd to a very Plentifull *Shower*, which put us upon producing all the Veſſels we had to Catch it as it Fell from the Heavens, or ran down the Skirts of our Tents; our Horſes at the ſame time Greedily Drinking it from the Ground. But we might have ſpared our Pains, for in leſs than *half* an *Hour's* time, our Camp was in a manner a Float, and we were Surrounded with *Water* not only ſufficient for us, but for an Army of 20000 *Men*; thoſe Hollow Guts which we paſſed over, without the leaſt appearance of Moiſture, were, by the Cataracts which Deſcended from the Mountains, become Rivers; ſo plentifully was God pleaſed to provide for us in our Greateſt Streight; and which increaſes both the Wonder and Mercy, the next Morning all this great Quantity of *Water* was paſſed away, ſo that in about 2 *Hours* Riding we could hardly perceive that there had been any *Rain* at all. This Memorable Place is known by the Name of *Al-Wiſhal*.

Oct. 4. From *Al-Wiſhal* we proceeded for *Tadmor*. Our way lay *Southward*, but the Gut in which we Travell'd, would not permit us to keep a Direct Courſe. However in about an *Hour's* walk, we paſſed by *Antor* Mountains (our Guide call'd them *Toul Antor*) through a Gut or Rent, both ſides of which ſo directly anſwered one to the other, they would tempt a Man to believe they were ſeparated by Art, for an Entrance into the Country. But

almoſt

almoſt as ſoon as we were well got within the open Space, we were oblig'd to Aſcend another Hill, and ſo our Road continu'd over Hills and Valleys interchangeably all the way. We had hardly proceeded 4 *Hours*, when we came to the Brow of a Rocky Mountain, ſeparated from that whereon ſtands the *Caſtle* of *Tadmor*, but by a Narrow Valley: in which Hill, by the way, appear'd ſome Quarries of Fine Stone, which probably might afford Materials to the Curious *Buildings* in the City; where we ſoon after arriv'd.

Fig. 63. Having Tir'd our ſelves with Roving from *Ruin* to *Ruin*, and Romaging among *Old Stones*; and more eſpecially not thinking it Safe to Linger too long in a Place, where ſhould the *Mountain Arabs*, (who were Enemies to *Aſſyne Abbaſſe*, our Friend) have Intelligence of us, they might either Fall upon, or endeavour to Intercept us in our Return;

On *Thurſday*, *Oct.* 8. about *half* an *Hour* after 4 in the Morning we Departed from *Tadmor*, being very well Satisfy'd with what we had ſeen, and Glad to have eſcap'd ſo Dreaded a Place, without any Trouble or Pretences upon us: but elſe with ſome Regret, for having left a great many things behind, which deſerv'd a more Particular and Curious Inſpection. Our Road lay almoſt due *Eaſt*, or a little enclining to the *North*: and on the Left Hand, a Ridge of Hills ſtretch'd along for a great ſpace, ſometimes about half an *Hour* Diſtant from the Road, and ſometimes opening wider. Theſe Hills we were told, were ſtor'd with rich *Veins* of divers *Minerals*, and afforded all that vaſt quantity of *Marble*, the *Remains* whereof we had ſeen at *Tadmor*: and it was from a *Fountain* call'd *Abulfarras*, at the Foot of one of them, they fetcht out *Water*, which we Drank there; the Inhabitants contenting themſelves with that which runs from the *Hot ſprings*. To the Right-hand lay a moſt Barren Plain, perfectly Bare, and hardly any thing Green to be ſeen therein, except it were a few *Gourds*, which our Servants found on the ſide of a little Riſing Ground, where there was no ſhew of any thing *Moiſt* to feed them. Our way being Plain, we had the Sight of *Tadmor*, eſpecially the *Caſtle*, for above half our Stage, till we came to an old *Caphar* Houſe. We made indeed a very ſhort Day's Journey in the whole, finding a *Fountain* of Excellent *Water* in about 5 *Hours* and a *half's* Riding: which as it was a moſt welcome *Refreſhment* to us in ſuch a Thirſty *Deſart*, ſo it was the only Good Water we met with till we came to *Euphrates*, which was not till the 3*d* Day from this Place. At this *Fountain* we Pitch'd, near to which is a Village, but almoſt wholly Ruin'd and Deſerted. 'Twas ſometime before any Body would be ſeen, for they were afraid of us: At length 3 Men came out to our *Tents*, Spectacles of a Miſerable Poverty, occaſion'd by their being frequently Pillag'd by the *Mountain Arabs*, and a Great *Duty* they pay to *Aſſyne Abbaſſe* their King, for his Protection. *Three hundred Dollars* they pay him Annually, when one would think the whole Village was not able to make up the Sum of *One hundred*: yet being the Remoteſt Place that was under his Juriſdiction, they often ſuffer by the Inroads of the others. The Name of the Place is *Yarecca*, a Name it receiv'd, (as we were inform'd) from a *Victory* obtain'd there by the *Turks* over the *Mamalukes*.

Oct. 9.

Oct. 9. From *Yarecca* we mounted early, and Travelling N. E. or near that Point, in 7 *Hours* time arriv'd at *Soukney*. The Road we found much like what we had the Day before, lying over a Barren Plain: only we had Hills on both ſides, and ſometimes Cloſing within *half* an *Hour's* Riding one of the other. The Village has its Name from the *Hot-Waters*, (for ſo the Word Imports) which are of the ſame Nature with thoſe of *Tadmor*: herein they *Bath* frequently, the ſame little Dirty Hole ſerving both for *Men* and *Women*; only they have ſo much *Modeſty* remaining, that they have different *Hours* for the One and the Other. To ſay the Truth, 'twas the only Mark of *Modeſty*: in other Reſpects they ſeem'd a Confident, or rather Impudent Generation of People. Before we could Pitch our Tents they Flockt about us in Multitudes, Men, Women and Children: and of the laſt many of them as Naked as ever they came into the World, not ſo much as a Rag about them to cover them; and ſo Numerous they appear'd, that if we had Reaſon to think *Yarecca* wanted Inhabitants, we had no leſs to Conclude *Soukney* over-ſtockt. At this Place uſually Reſides an Officer of *Aſſyne's*, who is their *Sub-Baſha*, or Governor: He whom we found there, was call'd *Dor*, of a good Family among the *Arabs*, to whom we made a Preſent, and he Civilly return'd it in Barley for our Horſes. Afterwards he came under our Tents, and Invited us to an Entertainment: which conſidering the Circumſtances of the Place, was very Splendid, though it was nothing but *Pilaw* at laſt, a little Diverſify'd by the Dreſſing; and, to ſpeak truly, I judge we could not have leſs than a Buſhel of Rice ſet before us. His Palace indeed was not very Stately; there being Few Cottages in *England* but might Vie with it. To the Room wherein we were Entertain'd, which doubtleſs was the Beſt, if not the only one he had, we were forc'd to Clamber, rather than Aſcend, by broken Steps made of Stone and Dirt. When we were got in, and commodiouſly Seated after the *Turkiſh* mode, it ſeem'd large enough for about a Dozen or 14 People: At the Upper End was a little ſpace Separated from the reſt by a Ridge made up of Earth, within which I ſuppos'd he Slept. The *Walls* were mean; but the *Roof* much worſe, having no other Covering but Faggots; ſo that certainly it could not be Proof againſt a Shower of Rain. However it Served well enough for our Afternoon's Collation; and we had come away with a good Opinion of the Gentleman's Civility, had he not afterwards endeavour'd to make a Pretence upon us, and ſo would have forc'd us to pay dear for our Rice: He Pretended to a Cuſtomary *Duty* of a *Chequeen* a Head of all *Franks* that paſt that Road; though probably neither he, nor his Grandfather before him, had ever ſeen a *Frank* there before. But when he underſtood by our Guide, that we were not ſo eaſily to be Impoſed upon; and withal, that we were *Aſſyne's* Friends, and in our way to his Tents; and eſpecially our Treaſurer a Perſon he very much Eſteem'd, who therefore would be ſure to acquaint him with any Exaction or Injury offer'd us, his Mouth was quickly ſtopt, and he grew ſo ſenſible of his Error, that he ſent to Excuſe it, and Preſented our Treaſurer with a *Fan* of *Black-Oſtrich Feathers*; and in the Morning

came himself, and Conducted us about an *Hour* on our way. This Village pays to *Assyne* 1500 *Dollars per Annum.*

Oct. 10. Continuing our Voyage still to the N. E. or something more *Easterly*, we found it another Pleasant and Easy Stage to another Village call'd *Tiebe*, so call'd (as they say) from the Goodness of the *Water*, the Word signifying Good: but we found them not so over Excellent; they had the Taste, and were doubtless Tinctured with the same *Mineral*, with those of *Soukney* and *Tadmor*, though not so Strong. But the Village it self made a better shew than Usual; and the People appear'd of some better Fashion, and more Civiliz'd, than those we had left. 'Tis Pleasantly Situated, and makes a good Appearance as one comes up to it; the Prospect being help'd by a well-built *Steeple*, to which is now adjoyn'd their *Mosque*: but I am apt to believe it the *Remains* of a *Christian Church*, being Built with some more Art and Beauty than you shall easily find in *Turkish* Fabricks: And there are also several *Ruins* about it, which speak it to have been a more famous place than now it is. Into the *Mosque* we were permitted to enter, without any Disturbance. This Village lies in one of the Roads from *Aleppo* to *Bagdatt*, and pays to *Assyne* an *Annual* Tribute of 1000 *Dollars*. From hence we mounted again in the Afternoon, and proceeded about 2 *Hours* and a *half* farther. Having Travell'd this Day, in all about 7, or 8 *Hours*; the Place we Pitcht at was a *Fountain*, and known by the Name of *Alcome*; but neither Town nor House by it: neither was the *Water* fit to be Drunk, being of the same Nature with that of *Soukney*, and almost as *Warm*.

Oct. 11. From *Alcome* we rose about an *Hour* and a *half* after Midnight, our Guide groping out the way by the help of the Stars, which now bended more to the *North* than formerly. As soon as 'twas Light enough to look about us, we found our selves in a Wild Open *Desart*, the Ground in some Places, Cover'd with a sort of *Heath*, and in others quite Bare. Nor had we Travell'd long after the Sun was up, before by the help of a Rising Ground, we discover'd *Arsoffa*; but 'twas after 10 a Clock before we Reach'd it: and finding no Water any where near, we were necessitated to proceed forward for the River *Euphrates*, which we found 4 *Hours* distant from it. *Arsoffa*, or (as the *Arabs* call it) *Arsoffa Emir*, seems to be the *Remains* of a *Monastery*, having no Town nor Village near it, and being one continu'd Pile of Building of an Oblong Figure, stretching longways *East* and *West*, and enclosing a very capacious *Area*. At a distance it makes a Glittering Shew, being built of *Gypsing Stone*, or *Rock Ising-glass*, resembling *Alabaster*, but not so Hard: several Quarries of which we past by in our way to it. When the Sun shines upon it, it Reflects the Beams so Strong, that they Dazle the Eyes of the Spectators. Art, or Accuracy, in the Workmanship we found none; and but very little *Carv'd* Work, and that Mean enough; nay the very Cement they made use of, is but little better than Dirt: So that it's no great wonder to see it in *Ruins*, though it has not the Appearance of any Great Antiquity. Round about were the little *Apartments* or *Chambers* for the *Monks*, built *Arch-wise*, only One

Story

Story above Ground; but Underneath are ſeveral *Cells* or *Vaults*, larger than the *Chambers*, which perhaps might ſerve for their *Schools*, or *Working-Houſes*. In the midſt of the *Area* ſtand the *Ruins* of ſeveral Buildings, ſome of which ſeem to have been *Ciſterns* for *Water*, and it may be the *Bathing-places*: but the moſt Remarkable was One, which probably was the *Abbot's* or *Biſhop's* Houſe, there having been ſome more Pains beſtow'd upon it, than the reſt: and Another, which was the *Relicks* of their *Church*. This was formerly no Unhandſome Structure, being Built in the Form of our *Churches*, and Diſtinguiſh'd into 3 *Iſles*, of which the Middle one is ſupported by 18 Turn'd *Marble Pillars*, with *Capitals* upon them, not of *Marble* but of a ſort of *Clay*, and *Caſt* into the Shape they are in, but of a *Colour* exactly reſembling the *Pillar* it ſelf. That which perſwades to believe them *Caſt*, is a *Greek Inſcription* to be ſeen on all of them; the *Letters* whereof are not made by *Inciſion* in the Stone, but ſeem to be Stamp'd, ſtanding out Higher than the Diſtance between them; and on one of them, by Miſtake, they are ſo Placed, as to be Read after the *Oriental* manner, from the Right-hand to the Left. The Words are theſe, with the *Crucifix* before, as follows:

✠ ΕΠΙ ΕΕΡΓΙ͵ ΕΠΙΕΚ° Τ͵ ΕΥΝΤΕ͂Ν ΜΑΡωΝΙ͵ Τ͵ ΧωΡΕΠΙΕΚ°.

From hence our Guide led us to the *River*, by the aſſiſtance of two little Hills, which are known by the Name of *Aſſ-Dien*, our way lying *North* and a little bending to the *Eaſt*. The Sight of the *River* was a very Pleaſing Proſpect: and to our great Comfort we found the Water very Clear, happening to be there before the *Rains*, and after the *Snow-waters* (which Swell and Diſturb it in the Summer time) were all paſt. We Pitcht upon a *Reach* of the *River*, where it was not very broad, not being above *half* a *Muſquet-ſhot* over.

Oct. 12. This Morning about Sun-riſe, we proceeded on our Voyage keeping along the Banks of the *River*, which for the moſt part led us *Weſt* and *North Weſt*: and here we had Pleaſant Travelling, having the *River* on the Right-hand, and Hills of *Marble* or other fine Stone, on the Left; and Delightful Groves of *Tamariſk*, *Mulberry*, and other Trees to paſs through. Here every thing about us lookt Freſh and Verdant, and we met frequently Men and Women, paſſing on their Occaſions, a thing to which (in our former Stages) we had not been accuſtom'd. We had alſo a Pleaſing Proſpect of the Oppoſite Shore, and could ſee a great way into *Meſopotamia*: but we could meet with no Convenience to Croſs the *River*. There are no Places of Note remaining upon the *River*, either on one ſide or the other, only on the farther ſide we Saw an Old *Caſtle* call'd *Giabar*, which made a Good Shew, being Situated on the Top of a Hill, and both for that and the way of Building, very much reſembling that of *Aleppo*; only that is the Larger, and in the midſt of a City; this Leſs, and has neither Town nor Houſes about it. On our ſide we paſt by a *Sheck's* Houſe, call'd *Abul-Rarra*, and the *Ruins* of a Town a little farther, where there was a *Square*

Tower built of very Ordinary Brick, but pretty Entire. After we had left these *Ruins*, we Rested to Bait, under the Shadow of a Rock, wherein were many *Apartments* and Conveniences Cut to Lodge in, which I suppose are made use of in the Winter by the People, who during the Summer, Pitch among the Trees by the *River* side. In the Afternoon we continu'd our Journey as before, keeping always at a little Distance from the *River*, till a little before Sun-set, having Travell'd 7 or 8 *Hours* the whole Day.

Oct. 13. This Day we had the same Satisfaction as the Day before, proceeding as near the *River* as the Road would Permit: and having made a Stage of about 6 *Hours*, we rested under the Shade of the *Tamarisk Trees* by the *River-side*. In our way we Saw the *Ruins* of a City call'd *Baulus*, where the *Turks* had formerly a *Sangiac*: but now there is never an Inhabitant in the Place, nor House standing, but the *Ruins* of Houses, and an *Octagonal Tower* of a considerable Height, *viz.*, 107 Steps, and Beautify'd on the out-side with *Flourishes* and an *Arabick Inscription* round about. It's a Handsome Structure, and probably the Work of the *Mamalukes*, since whose time little has been done to Adorn, but abundance to Destroy and Waste this Country. After Dinner we Mounted sooner than ordinary, because hoping to reach the *Tents* of *Assyne*, we were unwilling it should be Late when we arriv'd: yet we made it near Sun-set before we got to *Fay*, a *Fountain* by which he lay. We had Travell'd still on the same Point *N. W.* with the Prospect of the *River*, the greater part of the Way; the neareſt *Reach* thereof not being above an *Hour's* Riding from the *Fountain*. On the Road we met with several *Bandera's* of the *Emir's* Soldiers, who knowing our Guide, and understanding we were going to him, gave us a very Courteous *Salam*, who else, perhaps, might have Treated us with another sort of Civility. The *King's Tents* Spread over a Large Plain, and took up so Vast a Space, that though we had the advantage of a Rising Ground, we could not see the Uttermost Extent of them. His own particular *Tent* was pretty near the Middle of the rest, which were pitcht about it, not in a Circular manner, but stretching out in Length as the Plain Open'd, or for the better conveniency of a *Current* of *Water* which from the *Fountain* ran through the midst of them. 'Twas not at all Distinguishable from the rest but by its Bigness, and a little more Company about it; being all made of a sort of *Hair-cloth*. It cannot well be doubted but they are Descended from the Old *Arabes Scenitæ*, they Living just after the same manner, having no settled Abode, but remove from *Fountain* to *Fountain*, as they find Grass for their Sheep and Camels, and Water for them and themselves. They Love to Derive themselves from *Ismael*, the Son of *Abraham*.

As soon as we Alighted, we were attended by the Officers of the *Emir*, and conducted to a very Noble Tent built after the *Turkish* Mode, and pitcht next to his own. Hither he sent to bid us Welcome, and to enquire how we had Past in our Voyage; and presently after we had a Repast of several Dishes of Meat set before us, to stay our Appetites till a more plentifull

tifull Supper could be got ready. But before Supper the *King* himself made us a Visit in Person, bidding us Welcome to *Fay*, and asking what we had seen in our Travels that Pleased us? how we liked *Tadmor*? and whether we had found a *Treasure* there? For this Notion sticks in the Heads of these People, That the *Franks* go to see Old *Ruins*, only because they there meet with *Inscriptions* which direct them to some *Hid Treasures*. And therefore it's no unusual thing with them, when they find a Stone with an *Inscription* on one side, to Turn that Down to the Ground, that it might not be Seen or Read of any. But we Assur'd him we went with no such Expectations, but only out of a Desire to see the Place: neither had we brought any thing away with us but a piece of *Porphyry Stone*, which upon his Request, we shew'd him. We let him see too a kind of Rude Draught which we had taken of the Place; which he seem'd to Like. He made his Visit the shorter, that he might not Incommode us after our Journey: but desir'd us we would Live after our own Pleasure and to our Satisfaction, and Command freely whatever the Camp would afford; ordering some of his People constantly to Attend upon us. When there was mention made of our Design to be gone the next Morning, he answer'd, it must not be; himself was Invited, the next Day to a great Entertainment, by one of his *Grandees*, and we should acompany him: but the Day following he would go out with us, and Hunt part of our way towards *Aleppo*. When Supper was brought in, there was Victuals enough for 3 times our Number; A large Dish of *Pilaw* in the Middle, and 12 or 15 Dishes of several sorts of Meat about it, all Drest after their Manner, but exceeding Good. After we had Eat and Drunk what we pleased, we rose up, and our Servants sat down in our Places; it being the Custom of the *Arabs*, and *Turks* too, from the Highest to the Meanest, all to Eat at the same Table. The Best Sort sit down First, and so in order till all are Satisfy'd, and then what remains is carry'd away. We might, if we had pleased, have Lodged under the same Tent where we Eat; but having Tents of our own Pitcht, some of our Company chose rather to Retire thither, to avoid being Disturb'd by too many Visitants,

Oct. 14. The next Morning, about 10 a Clock, we were told that the *King* was gone to the Entertainment, and Expected we should follow him; and that 2 *young Camels* were Kill'd, to furnish this Sumptuous Feast; which is the Highest piece of Magnificence and Greatness to which these People, whose Greatest Riches consist in *Camels*, can arrive. The Tent was about a *Furlong* from ours; so Mounting our *Horses*, we Rode to it and found it Surrounded with a Numerous Train of Guests; 300 at least, of different Sort and Quality. It was very Large of it self; and to be still more Capacious, 'twas left open toward the *West*. The *King* was Seated at the *North*-end, about the Midst of the Tent, upon a place Rais'd with *Cushions* and *Quilts*, and *Carpets* before him: neither did he Sit *Cross-Legg'd*, as all the rest of the Company were oblig'd to do, but in a Leaning Posture. They seem'd to observe an exact Order in their Places; and when any Person of Note Enter'd, those that were near his Place, rose up and stood till he had

Seated

Seated himſelf. But the far greateſt part could not come within the Compaſs of the Ring, but ſtood behind the backs of the reſt, leaving a Spacious *Area* vacant in the middle. When we enter'd, they made Room for us on the *King's Left-Hand*, which here is eſteem'd the more Honourable; where we ſate down in the ſame Poſture with thoſe about us, *Croſs-Legg'd*, upon a Thin *Carpet*. Before Mid-day a *Carpet* being Spread in the Middle of the Tent, our Dinner was brought in, being ſerv'd up in large Wooden Bowls between Two Men: and truly to my apprehenſion, Load enough for them. Of theſe Great Platters there were about 50 or 60 in Number, perhaps more, with a great many Little ones, I mean, ſuch as One Man was able to bring in, ſtrew'd here and there among them, and placed for a Border or Garniſh round about the Table. In the Middle of all was One of a Larger Size than all the reſt, in which were the *Camels Bones* and a Thin *Broth* in which they were Boil'd: The other Greater ones ſeem'd all fill'd with one and the ſame Sort of Proviſion; a kind of *Plumb-Broth*, made of *Rice*, and the Fleſhy part of the *Camel*, with *Currants* and *Spices*, being of ſomething a Darker Colour than what is made in our Country. The leſſer were, for the moſt part, Charged with *Rice* Dreſs'd after ſeveral Modes, ſome of them having *Leben* (a Thick Sour Milk) pour'd upon them. *Leben* is a thing in mighty Eſteem in theſe Hot Countries, being very uſeful to Quench *Thirſt*: And truly we had need of it here; for I did not ſee a Drop of any ſort of *Liquor*, excepting a Diſh of *Coffee* before Dinner, Drunk at this Splendid Feaſt. *Knives*, *Forks*, *Spoons*, *Trenchers*, &c. are Silly impertinent things in the Eſteem of the *Arabs*: however, we being known to make uſe of ſuch things, had large wooden Spoons laid before us. When the Table was thus plentifully Furniſh'd, the *King* ariſing from his Seat, went and ſate down to that Diſh that was directly before him; and ſo did the reſt, as many as it would contain; which could not be much ſhort of 100: and ſo without any further Ceremony, they fell too, thruſting their Hands into the Diſhes; and Eating by Handfulls. Neither was there any occaſion of *Carving*; only becauſe thoſe Diſhes in the Middle were too remote to be Reach'd, there was an Officer on purpoſe, who Stepping in among them, and Standing in places deſignedly left for that end, with a long Ladle in both his Hands, help'd any one according to their Deſires. When the *King* had eaten what he thought fit, he roſe up and Waſht, and retir'd back to his former Seat; and we alſo did the like; others being ready to fill our places. Nor did we continue much longer under the *Tent* in that Numerous Crowd; for *Aſſyne* perceiving us a little Uneaſy, and ſuppoſing we had now ſufficiently ſatisfy'd our Curioſity, though perhaps not our Appetites, told us, we might take our Liberty, and if we thought fit Retire to our Tents. This Favour we gladly accepted, and without Ceremony Return'd, ſeveral of his Attendants waiting upon us back. Here we had another Dinner ſet before us, and having ſome of our own Wine and Water to Drink with it, it went down better with us than the famous *Camel* Feaſt. In the Evening, the *King* mounted to ſee the Flight of a New *Hawk*, and ſtay'd abroad very late, his *Hawk* Flying

ing away: but she was afterwards taken up by his *Falconer*; otherwise he had not been in a good Humour all that Night, being a Man that delights very much in Sport. After his Return from *Hawking*, we went to wait upon him at his own Tent, to return him Thanks for his most Courteous and Royal Reception of us, and to desire leave to depart the next Morning. Here we found him Surrounded with the chiefest of his People; and being Placed again on his *Left-Hand*, he Entertain'd us with a great deal of Pleasant Discourse; and Ask'd such Questions as shew'd him to be a Man of extraordinary Capacity and Judgment. As for Learning they have no such thing among them, and therefore it's not to be expected that he should be a Schollar: but were he not a Person of more than common Prudence and Understanding, he could never have manag'd that Wild and Unruly People as he has done, ever since his Advancement to the Throne; which must therefore have been the more Difficult, because as he came to it by the *Deposition* of his *Father* (though not Immediately) who now Lives with him as a Private Man, so has he never wanted Competitors. To his *Father* he pays a great deal of outward Respect, but is forc'd to keep a very watchful Eye over him. After about an Hour's Discourse, we were Dismiss'd.

Oct. 15. In the Morning, *Assine* not being at leisure to go a *Hunting*, we proceeded on our Voyage Homewards, with a great deal of Alacrity; and in about 3 *Hours* and an *half* arriv'd at *Seray*: And hence after a short Repast, we continu'd our Journey to *Sherby Fountain*; which took us up about the like Space of Time. Here we accounted our selves as good as at Home, being at a Place with which we were well acquainted, and to which several times in the Year some or other of our Nation usually Resort, either for *Gazel* or *Hog-hunting*, according to their Season: nor had we hence above 7 or 8 *Hours* to *Aleppo*.

Oct. 16. Getting up pretty early in the Morning, we resolved to Hunt the greatest part of our way home, as we did; and Dining at the Famous *Round-Hill*, whereon has been spent by the *English*, more Money than would purchase a Noble Estate round about it, in the Afternoon we arrived at *Aleppo*.

3. We Departed from *Aleppo* on *Michaelmas day* 1691. and in 6 easie *Days* Travel over a *Desart* Country, came to *Tadmor*. As we rode into the Town we took notice of a *Castle* about *half* an *Hour's* Distance from it, and so situated as to command both the Pass into the *Hills*, by which we Entred, and the City too. But we could easily perceive it was no *Old Building*, retaining no Foot-steps of the Exquisite *Workmanship* and Ingenuity of the *Ancients*. Upon Enquiry we were informed, that it was Built by *Man-Ogle*, a Prince of the *Druces*, in the Reign of *Amurath* the *Third* A. D. 1585. But I know not how to give much Credit to this Story, because I find not that either *Man-Ogle*, or any *Drucian* Prince, was ever Powerful in these parts, their Strength lying on Mount *Libanus*, and along the Coast of *Sydon*, *Berytus*, *&c.* 'Tis a Work of more Labour than Art, and the very Situation alone is enough to render it almost Impregnable; standing on the Top of a very

An Account of Tadmor; *by Mr.* Will. Halifax. *n.* 217. *p.* 83.

very High Hill, encloſed with a deep *Ditch*, cut out of the very Rock, over which there was only one Sole Paſſage by a *Draw-Bridge*: This *Bridge* too is now broken down; ſo that there is no entrance remaining, unleſs you will be at the Pains to clamber up the Rock, which is in one place Feaſible, but withall ſo Difficult and Hazardous, that a ſmall ſlip may endanger one's Life. Nor is there any thing within to be ſeen ſufficient to Recompenſe your Trouble of getting up to it, the Building being Confuſed, and the *Rooms* very Ill Contrived. Upon the Top of the *Hill* there is a *Well* of a Prodigious Depth, as certainly it muſt be a great way to come at *Water* from the Top of ſuch a Rock, the *Ditch* that ſurrounds it, not having the leaſt appearance of Moiſture therein; which made it, therefore ſeem more Strange that a *Wild-Boar* ſhould ruſh out thence amongſt our Horſes, when we rode up to take a more particular View of the Place.

This *Caſtle* ſtands on the *North* ſide of the Town, and from hence you have the beſt Proſpect of the Country all about. You ſee *Tadmor* under you incloſed on 3 ſides with long Ridges of Mountains, which open towards the *Eaſt* gradually to the diſtance of about an *Hour's* Riding: but to the *South* ſtretches a vaſt Plain beyond the reach of the Eye. In this Plain you ſee a large Valley of *Salt*, affording great Quantities thereof, and lying near about an *hour's* Diſtance from the City. And this more probably is the *Valley* of *Salt*, mentioned 2 *Sam.* 8. 13. Where *David* ſmote the *Syrians*, and ſlew 18000 Men, than another which lyes but 4 *hours* from *Aleppo*, and has ſometimes paſs'd for it. The *Air* is Good, but the *Soil* exceeding Barren, nothing *Green* to be ſeen therein, ſave ſome few *Palm-Trees* in the *Gardens*, and here and there about the Town. And from theſe Trees I conceive is obtained its Name, both in *Hebrew* (*Tadmor*, which ſignifies a *Palm-Tree*) and in *Latin* (*Palmira*;) and the whole Country is thence Denominated *Syria Palmirena*; and ſometimes *Solitudines Palmirenæ*: So that the *Latines* did not Change but only Tranſlate the old Name, which therefore ſtill obtains in theſe *Eaſtern* parts, and the more *Modern* is wholly unknown. The City it ſelf appears to have been of a large Extent, by the Space now taken up by the *Ruins*: but there are no Footſteps of any *Walls* remaining, nor is it poſſible to judge of the Ancient Figure of the Place. The Preſent Inhabitants, as they are Poor, Miſerable, Dirty People, ſo they have ſhut themſeves up, to the Number of about 30 or 40 Families, in little Hutts made of Dirt, within the *Walls* of a Spacious *Court*, which encloſed a moſt Magnificent *Heathen Temple*. Hereinto alſo we Entred, the whole Power of the Village if I may ſo call it, being gathered together at the Door, whether to ſtand upon their Defence, in caſe we proved Enemies, (for ſome of them had their Guns in their Hands) or out of meer Curioſity to Gaze upon us, I know not. However our *Guide*, who was an *Arab*, whom *Aſſyne*, their Preſent *King*, had ſent to Conduct us through the whole Voyage, being a Man known among them, we had an eaſie Admittance, and with a great many welcomes in their Language were led to the *Sheck's* Houſe, with whom we were to make our Abode. And

to mention here what the Place at first View Represents; Certainly the World it self cannot afford the like Mixture of *Remains* of the greatest *State* and *Magnificence*, together with the Extremity of *Filth* and *Poverty*. The neareſt Parallel I can think of, is that of the *Temple* of *Baal*, Deſtroyed by *Jehu*, and converted into a *Draught-Houſe*. And if, what is not improbable, this very place was a *Temple* of *Jupiter Belus*, the Similitude will run upon all Four.

The whole Incloſed ſpace is a *Square* of 220. *Yards* each ſide, encompaſs'd with a High and Stately *Wall*, built of large ſquare Stone, and Adorn'd with *Pilaſters*, within and without, to the number (as near as we could compute by what is ſtanding of the *Wall*, which is much the greater part) of 62. on a Side. And had not the Barbarity of the *Turks*, Enemies to every thing that is *Splendid* and Noble, out of a vain Superſtition, purpoſely Beat down thoſe Beautiful *Corniſhes* both here and in other Places, we had ſeen the moſt Curious and Exquiſite *Carvings* in *Stone*, which perhaps the World could ever Boaſt of; as here and there a Small *Remainder*, which has eſcaped their Fury, does abundantly evidence. The *Weſt* ſide, wherein is the Entrance, is moſt of it broken down, and near the Middle of the Square, another Higher *Wall* Erected out of the *Ruins*; which ſhews to have been a *Caſtle*, Strong but Rude; the Old Stones and many *Pillars* broken or ſawn aſunder, being roll'd into the Fabrick, and ill Cemented. Within were to be ſeen the *Foundations* of another *Wall*, which Probably might anſwer the *Front*; and that the *Mamalukes*, whoſe Workmanſhip it ſeems moſt likely to have been, Built the *Caſtle* here for the Security of the Place. Before the whole Length of this New Front, except a narrow Paſſage which is left for an Entrance, is Cut a Deep *Ditch*, the Aſcent whereof on the Inner ſide is fac'd with Stone to the very Foot of the *Wall*, which muſt have render'd it very Difficult to have Aſſaulted it. The Paſſage to, and the Door it ſelf, is very Narrow, not wider than to receive a Loaded *Camel*, or that two Footmen may well walk a-breaſt. And as ſoon as you are within the Firſt Door, you make a ſhort Turn to the Right, and paſs on to another of the like bigneſs, which leads into the *Court*. But all this is but a New Building upon an Old, and by this Outward Wall is quite ſhrouded that *Magnificent Entrance*, which belong'd to the Firſt Fabrick; of the Stateline's whereof we were enabled to judge by the two Stones which ſupported the Sides of the Great *Gate*, each of which is 35 *Foot* in Length, and Artificially *Carved* with *Vines* and *Cluſters* of *Grapes*, exceeding Bold and *to the Life*. They are both Standing, and in their Places: and the Diſtance between them, which gives us the wideneſs of the *Gate*, 15 *Foot*. But all this is now *Walled* up to the Narrow Door before mention'd. Over the little Door there is an *Inſcription* in *Greek*, and alſo another in another *Language* and *Character*, which I never ſaw till in *Tadmor*, nor Underſtand what to make of it. From that in *Greek* we hop'd for ſome Information; but it will be Evident to any one that Reads it, that the Stone was brought from another Place, and caſually put in there. 'Tis thus:

ΤΟ ΜΝΗΜΕΙΟΝ ΤΟΥ ΤΑΦΕΩΝΟC ΕΚΤΙCΕΝΕΞΙΔΙΩΝ
CΕΠΤΙΜΙΟC ΟΔΑΙΝΑΘΟC Ο ΛΑΜΠΡΟΤΑΤΟC
CΥΝΚΛΗΤ[ΙΚΟC] ΑΙΡΑΝΟΥ ΟΥ ΑΒΑΛΛΑΘΟΥ ΤΟΥ
ΝΑCΩΡΟΥ ΑΥΤΩΤΕ ΚΑΙ ΥΙΟΙC ΑΥΤΟΥ ΚΑΙ ΥΙΩΝΟΙC
ΕΙC ΤΟ ΠΑΝ-ΤΕΛΕC ΑΙΩΝΙΟΝ ΤΕΙΜΗΝ.

Under this was the *Unknown Character*, which I ſhall here give you a
Fig. 64. *Specimen* of, as well as it could be taken.

The Letters between theſe [ ] *Marks* were not Legible, but I have Ventured to *Supply* the *Defect*, as alſo you will ſee in ſome others following. Neither was the Ε in ΜΝΗΜΕΙΟΝ upon the *Stone*, but was doubtleſs omitted by Miſtake: and the *Inſcription* is nothing elſe, but the *Inſcription* of a *Sepulchre*, the like to which we ſaw Several. And as for the other *Character*, it being Added almoſt under every *Greek Inſcription* we ſaw, and rarely found Alone, I am apt to Believe it the *Native Language* and *Character* of the Place, and the Matter it contains, nothing elſe but what we have in the *Greek*.

As ſoon as you are Enter'd within the Court, you ſee the *Remainders* of 2 *Rows* of very Noble *Marble Pillars*, 37 *Foot* High, with their *Capitals* of moſt exquiſite *Carved Work*; as alſo muſt have been the *Corniſhes* between them, before by Rude and Superſtitious Hands they were broken down. Of theſe there are now no more than 58 Remaining Entire; but there muſt have been a great many more, for they appear to have gone quite Round the Whole Court, and to have Supported a moſt Spacious double *Piazza* or *Cloyſter*. Of this *Piazza* the *Walks* on the Weſt ſide, which is oppos'd to the *Front* of the *Temple*, ſeem to have Exceeded the other in Beauty and Spaciouſneſs; and at each End thereof are two *Niches* for *Statues* at their full Length, with their *Pedeſtals*, *Borders*, *Supporters*, and *Canopies*, *Carved* with the greateſt Artifice and Curioſity. The Space within this once Beautiful Encloſure, which is now fill'd with nothing but the Dirty Huts of the Inhabitants, I conceive to have been an Open Court, in the midſt whereof ſtands the *Temple*, Encompaſſed with another *Row* of *Pillars* of a different *Order*, and much Higher than the former, being above 50 *Foot* High. Of theſe Remain now but 16. But there muſt have been about Double that Number, which whether they Encloſed an Inner Court, or Supported the Roof of a *Cloyſter*, there being now nothing of a Roof remaining, is uncertain. Only one Great Stone lies down, which ſeems to have reacht from theſe *Pillars* to the *Walls* of the *Temple*. The Whole Space contain'd within theſe *Pillars*, we found to be 59 *Yards* in Length, and in Breadth near 28. In the Midſt of which Space is the *Temple*, Extending in Length more than 33 *Yards*, and in Breadth 13, or 14. It Points North and South, having a moſt Magnificent *Entrance* on the Weſt, exactly in the Middle of the Building, which, by the Small *Remains* yet to be ſeen, ſeems to have been one of the moſt Glorious Structures in the World. I never ſaw *Vines* and *Cluſters* of *Grapes* Cut in Stone ſo *Bold*, ſo *Lively*, and ſo *Natural* in any place. Juſt

over

over the *Door* we could make a ſhift to Diſcern part of the *Wings* of a Large Spread *Eagle*, Extending the whole Wideneſs thereof. The Largeneſs whereof led me at firſt to Imagine it might have been rather a *Cherub* Overſhadowing the *Entrance*, there being nothing of the Body Remaining to guide one's Judgment, and ſome little *Angels* or *Cupids* Appear ſtill in the Corners of the ſame Stone. But afterwards ſeeing other *Eagles* upon Stones that were fallen down, I conclude this muſt have been one likewiſe, only of a much Larger Size. Of this *Temple* there is nothing at Preſent but the Outward Walls Standing, in which it is Obſervable, that as the *Windows* were not Large, ſo they were made Narrower towards the Top, than they were Below, but all Adorn'd with Excellent *Carvings*. Within the Walls the *Turks*, or more probably *Mamalukes*, have built a *Roof*, which is Supported by Small *Pillars* and *Arches*; but a great deal Lower, as well as in all other reſpects Diſproportionate and Inferiour to what the *Ancient Covering* muſt have been. And they have Converted the Place into a *Moſque*, having Added to the South End thereof New Ornaments after their manner, with *Arabick Inſcriptions* and Sentences out of the *Alcoran* wrote in Flouriſhes and Wreaths, not without Art. But at the North End of the Building which is ſhut out of the *Moſque*, are *Relicks* of much Greater Artifice and Beauty. Whether they were in the Nature of *Canopies* over ſome *Altars* plac'd there, or to what other Uſe they ſerv'd, I am not able to Conjecture. They are Beautify'd with the moſt Curious *Fretwork* and *Carvings*; In the midſt of which is a *Dome* or *Cupola*, above 6 *Foot* Diameter, which we found above to be of One Piece: whether Hewn out of a Rock *Entire*, or made of ſome *Artificial* Cement or Compoſition, by time harden'd into a *Lapideous* Subſtance, ſeems Doubtful; tho' I am rather inclin'd to believe the latter. It is, *in Fine*, a moſt Exquiſite piece of Workmanſhip, and on which I could have beſtow'd more time to View it, than what was allowed us.

Having paſt by the *Ruins* of a Handſome *Moſque*, we had the Proſpect of ſuch *Magnificent Ruins*, that if it be Lawful to frame a Conjecture of the Original Beauty of that Place, by what is ſtill remaining, I queſtion ſomewhat whether any City in the World could have challeng'd Precedence of this in its Glory.

Advancing towards the North, you have before you a very Tall and Stately *Obelisk* or *Pillar*, conſiſting of 7 Large Stones, beſides its *Capital* and the Wreathed Work about it; the *Carvings* here, as in all other places, being Extraordinary Fine. The Height of it is above 50 *Foot*, and upon it I conceive may have ſtood a *Statue* which the *Turks*, Zealous Enemies of all *Imagery*, have Thrown down, and Broken in pieces. 'Tis in Compaſs juſt above the *Pedeſtal*, 12 *Foot* and a *half*. On each Hand of this, towards the Eaſt and Weſt, you ſee two other Large *Pillars*, each a Quarter of a *Mile* Diſtant from you, which ſeem to have ſome Correſpondence one to the other. And there is a Piece of another, Standing near that of the Eaſt, which would encline one to Think, there was once a Continued *Row* of them. The Height of this to the Eaſt I took with my *Quadrant*, and Con-

clude to be more than 42 *Foot* High, and the Circumference Proportionable. Upon the Body thereof is the following *Inſcription*:

Η ΒΟΥΛΗ ΚΑΙ Ο ΔΗΜΟC ΑΛΙΛΑΜΕΝΑ ΠΑΝΟΥ ΜΟΚΙΜΟΥ
ΤΟΥ ΑΙΡΑΝΟΥ ΤΟΥ ΜΑΘΘΑ ΚΑΙ ΑΙΡΑΝΗΝ ΤΟΝ ΠΑΥΕΡΑ
ΑΥΤΟΥ ΕΥCΕΒΕΙC ΚΑΙ ΦΙΛΟΠΑΤΡΙΔΑC Κ[ΑΙ] ΠΑΝΤΙ ΤΡΟΠΩ
[ΕΥ] CΕΙΜΩC ΑΡΕCΑΝΤΑC ΤΗ ΠΑΤΡΙΔΙ ΚΑΙ ΠΑΤΡΙΟΙC
ΘΕΟΙC ΤΕΙΜΗC ΧΑΡΙΝ ΕΤΟΥC Ν Υ Α ΜΗΝΟC ΞΑΝΔΙCΟΥ.

It ſeems Evident by this and ſome following *Inſcriptions*, that They were a *Free State* Govern'd by a *Senate* and *People*, though perhaps under the Protection of Greater *Empires*; the *Parthians*, it is probable, firſt, and afterwards the *Romans*, who for a long time Contended for the Maſtery here in the Eaſt. And this Government might Continue among them till about the Time of *Aurelian*, who Demoliſht the Place, and Led *Zenobia*, Wife of *Odenatus*, Captive to *Rome*: who, though ſhe be call'd *Queen*, yet I find not that ever her Husband had the Title of *King*; but was only one of the Chief Inhabitants, a Leading Man in the *Senate* (as 'tis probable theſe *Alilamanes* and *Airanes* were before him) who while the *Romans* were buſied in *Europe*, made himſelf great here, and by his own Force repell'd the *Parthians*; who having Maſter'd whatever was held by the *Romans* on the other ſide of *Euphrates*, made an Incurſion into *Syria*, but were by *Odenatus* driven back beyond the River. In the Courſe of theſe Wars *Odenatus* was Slain: but his Wife *Zenobia*, being a Woman of a Maſculine Spirit, not only kept her Ground againſt her Enemies Abroad, but maintain'd her Authority at Home, keeping the Government in her Hands. Afterwards out of a Deſire to caſt off the *Roman* Yoke, ſhe Caus'd the whole Garriſon which was left there by *Aurelian*, to be Barbarouſly Cut off. Which bringing *Aurelian* back with his Army, he quickly took the City, and Deſtroy'd it, putting the Inhabitants to the Sword, and carrying *Zenobia* Captive to *Rome*; which was the Fatal Period of the Glory of that Place. This Cuſtom of theirs of running up their *Genealogies* or *Pedigrees* to the 4th or 5th Generation, ſhews them to have Borrow'd ſome of their Faſhions from their Neighbours the *Jews*, with whom it is not unlikely they had of Old great Commerce; and perhaps many of them were Deſcended from that People, *Zenobia* herſelf being ſaid to have been a *Jeweſs*: Or elſe, this muſt have been the Manner of all the *Eaſtern Nations*. Their *Æra*, or Account of Time, they begin from the *Death* of *Alexander the Great*, as the *Syrians* generally do: the very *Chriſtians* at this Day following the ſame Uſage. Yet though they Mark the Date of the *Year* by *Greek Letters*, you may Obſerve they place them a Different way from the *Greeks*, ſetting the Leſſer Number firſt, as if they were to be Read Backward, from the Right Hand to the Left; Ν Υ here, Denoting 450. The 3*d* Letter Α, I take to ſtand for the *Day* of the *Month*, *viz.* the Laſt of *Xandicus* which is with us *April*; this and other Names of *Months* which are found in other *Inſcriptions*, being Borrow'd from the *Macedonians* with very little Variation. That they

were

were *Idolaters* is Plain by the mention of their Country Gods, both here and in other Places: So that their Commerce with the *Jews*, did not, it seems, bring them to the Knowledge of the True God; or else they must have Degenerated therefrom, and Relaps'd into *Idolatry*. The other *Pillar* towards the West in Height and Circumference Answers this, and has upon the side the following *Inscription* Engraved.

Η ΒΟΥΛΗ ΚΑΙ Ο ΔΗΜΟC ΒΑΡΕΙΧΕΙΝ ΑΜΡΙCΑΜCΟΥ ΤΟΥ
ΙΑΡΙΒΩΛΕΟΥC ΚΑΙ ΜΟΚΙΜΟΝ
ΥΙΟΝ ΑΥΤΟΥ ΕΥCΕΒΕΙC ΚΑΙ
ΦΙΛΟΠΑΤΡΙΔΑC ΤΕΙΜΗC ΧΑΡΙΝ.....

The Date of this is not Legible, neither does one Know what Judgment to make of the thing it self. That such a *Pillar* should be Erected only to Support the *Inscription*, and Convey these Mens Names to After ages, without Particularizing what they Did to Deserve that Honour, is something Strange: unless we may suppose it was a Prevailing *Vanity* in these *Eastern* Countries, thus to endeavour to Eternize their Fame; an Instance whereof we have in *Scripture*, in *Absalom*'s Setting up a *Pillar*, and perhaps before him, in *Saul*. Otherwise it may appear no Improbable Conjecture, that the *Pillar* was Erected long before upon some other Occasion, and afterwards made use of to this End: And I look upon it as past all Doubt that several other *Inscriptions*, which we saw, were much more Modern than the *Pillars* on which they were Engrav'd.

2 *Kings*, 18. 18.
1 *Sam.* 15. 12.

Proceeding forward, directly from the *Obelisk*, about 100 *Paces*, you come to a Magnificent *Entrance*, Vastly Large and Lofty, and for the Exquisiteness of the Workmanship not Inferior to any thing before Describ'd. This *Entrance* Leads you into a Noble *Piazza* of more than *Half* a *Mile* Long (930 *Yards* according to our Measuring) and 40 *Foot* in Breadth, Enclos'd with 2 *Rows* of Stately *Marble Pillars*, 26 *Foot* High, and 8 or 9 About. Of these Remain Standing and Entire 129; but by a moderate Calculation, there could not have been less than 560. *Covering* there is none Remaining, nor any *Pavement* at the Bottom, unless it be Bury'd under the Rubbish: But upon almost all the *Pillars* we found *Inscriptions*, both in *Greek* and the *Language Unknown*, of which we had but time to take these Few, and those not very Instructive.

ΙΟΥΛΙΟΝ ΑΥΡΗΛΙΟΝ ΖΕΒΕΙΔΑΝ ΜΟΚΙΜΟΥ ΤΟΥ
ΖΕΒΕΙΔΟΥ ..... ΑCΘωΡΟΒΑΙΔΑΟΙ CΥΝ
Α[Υ]Τω ΚΑΤΕΛΘΟΝΤΕC ΕΙC ΟΛΟΥΕCΙΑΔΑ ΕΝΠ
ΟΡΟΙΑΝ ΕCΤΗCΑΝ ΑΡΕCΑΝΤΑ ΑΥΤΟΙC ΤΕΙΜΗC
ΧΑΡΙΝ ΞΑΝΔΙΚω ΤΟΥ ΗΝΦ ΕΤΟΥC....

This last *Inscription* seems to have been put in Memory of an *Embassy*, perform'd by those Men that are Named therein, for Settling a Commerce and Traffick, which was to their Satisfaction Accomplisht. But with whom,

whom, till I can find out what Place is meant by ΟΛΟΓΕCΙΑΔΑ, I must remain Ignorant. I am Unwilling to entertain any thoughts of *Getia* in *Macedonia*, or of *Olgassus*, a Place mention'd by *Strabo* in *Bithynia*, which comes a little nearer the Name: being both so Remote, and the City of *Tadmor* so ill contriv'd for a Place of Trade, being far from the Sea, and without the Advantage of any River. Yet the *Magnificence* of the Place shews they have not wanted Riches among them: And their *Salt* is a Commodity which still brings them in a Considerable Advantage. The order of the *Numeral Letters* you may take notice is again Inverted; but taking them the Right way, the Year 558. falls in with the last Year of *Alexander Severus*, which is of *our Lord* 234.

About the Middle of the *Piazza*, upon another *Pillar*, was this following *Inscription*:

Η ΒΟΥΛΗ ΚΑΙ Ο ΔΗΜΟC ΙΟΥΛΙΟΝ ΑΥΡΗΛΙΟΝ ΖΗΝΟΒΙΟΝ ΤΟΝ ΚΑΙ ΖΑΒΔΙΛΑΝ ΔΙCΜΑΛΧΟΥ ΤΟΥ ΝΑCCΟΥΜΟΥ CΤΡΑΤΗΓΗCΑΝΤΑ ΕΝ ΕΠΙΔΗΜΙΑ ΘΕΟΥ ΑΛΕΞΑΝΔΡΟΥ ΚΑΙ ΥΠΗΡΕΤΗCΑΝΤΑ ΠΑΡΟΥCΙΑ ΔΙΗΝΕΚΕΙΡΟΥΤΙΛΛΙΟΥ ΚΡΙCΠΕΙΝΟΥ ΤΟΥ ΗΓΗCΑΜΝΕΟΥ ΚΑΙ ΕΠΙΔΗΜΗCΑCΑΙC ΟΥΗΞΙΛΛΑΤΙΟCΙΝ ΑΓΟΡΑΝΟΜΗCΑΝΤΑΤΕ ΚΑΙ ΟΥΚΟΝΙCωΝΑ ΦΕΙΔΗCΑΝΤΑ ΧΡΗΜΑΤωΝ ΚΑΙ ΚΑΛωC ΠΟΛΕΙΤΕΥCΑΜΕΝΟΝ ωC ΔΙΑ ΤΑΥΤΑ ΜΑΡΤΥΡΗΘΕΝΤΑ ΥΠΟ ΘΕΟΥ ΙΑΡΙΒωΛΟΥ ΚΑΙ ΥΠΟ ΙΟΥΛΙΟΥ .....ΤΟΥ ΕΞΟΧωΤΑΤΟΥ ΕΠΑΡΧΟΥ ΤΟΥ ΙΕΡΟΥ ΠΡΑΙΤωΡΙΟΥ ΚΑΙ ΤΗCΠΑΤΡΙΔΟC ΤΟΝ ΦΙΛΟΠΑΤΡΙΝ ΤΕΙΜΗC ΧΑΡΙΝ ΕΤΟΥC Δ Ν Φ.

This is as perfect an *Inscription* as any I met with, by the help of which we may make a Judgment of all the rest; at least thus far, that they were put up in Memory of some, who had behav'd themselves, in those Publick Offices they bore, either in their Own Republick or under the *Romans*, with Commendation: this being a Publick Place, where their Names and Worthy Actions were Recorded and Transmitted to Posterity. What I further observ'd particularly in this, was the want of the Name after ΙΟΥΛΙΟΥ, and took notice of the like Space Vacant in the other *Language* under it: and in both Places it seem'd to be not Worn out with Time, but Voluntarily Scratcht out: Which Confirms me in the Opinion that they are both one, and that the *Unknown* was the *Vulgar*, as the *Greek* was the *Learned Language* of the Place.

Upon another *Pillar* in the same *Walk* was this;

CΕΠΤΙΜΙΟΝ ΟΥΟΡωΔΗΝ ΤΟΝ ΚΡΑΤΙCΤΟΝ ΕΠΙΤΡΟΠΟΝ CΕΒΑCΤΟΥ ΔΟΥΚΗΝΑΡΙΟΝ ΚΑΙ ΑΡΟΠΕΤΗΝ ΙΟΥΛΙΟC ΑΥΡΗΛΙΟC ΕΛΑΜΗC ΚΑCCΙΑΝΟΥ ΤΟΥ Μ[Ε]ΛΕΝΑΙΟΥ ΙΠΠΕΥC ΡωΜΑΙωΝ ΤΟΝ ΦΙΛΟΝ ΚΑΙ ΠΡΟCΤΑΤΗΝ ΕΤΟΥC Η Ο Φ.. ΜΗΝΕΙ [Ξ]ΑΝΔΙΚω.

From another *Pillar* in the same *Piazza* was Transcrib'd this Broken *Inscription* which follows; which I have endeavour'd to make up from the former;

former, believing them in Subſtance the very ſame, with ſome little Alteration of Names.

ϹЄΠΤΙΜ[ΙΟΝ ΟΥΟΡωΔΗΝ] ΤΟΝ ΚΡΑ [ΤΙϹΤΟΝ ЄΠΙΤΡΟ]ΠΟΝ ϹЄΒΑϹ[ΤΟΥ ΔΟΥΚ]ΗΝΑΡΙΟΝ ΚΑ[Ι ΑΡΟΑΠЄ]ΤΗΝ ΙΟΥΛΙΟϹ ΑΥ[ΡΗΛΙ]ΟϹ Є[ΛΑΜΗϹ] ΠΤΙΛϹΟϹ Μ[ЄΛЄΝΑΙ]ΟϹ ΜΑΛωΧΑ ΝΑϹϹΟΥΜΟ[Υ] Ο ΚΡΑΤΙϹΤΟϹ ΤΟΝ [ΦΙΛΟΝ] ΚΑΙ ΠΡΟϹΤΑΤΗΝ ΤЄΙΜΗϹ ЄΝЄΚЄΝ ЄΤΟΥϹ.... [ΜΗΝЄΙΞ] ΑΝΔΙΚω.

What we may Collect from both theſe *Inſcriptions*, and divers others of a like Import, is, That as the *State*, the *Senate*, and *People*, did ſometimes Honour thoſe that had been in Publick Truſt with *Inſcriptions* on theſe *Pillars*: So when this was not done by them, *Private* Perſons had the Liberty to do the ſame for their *Friends*. And I ſhall give you an Inſtance by and by of one Engraven by a *Husband* in Memory of his *Wife*.

Upon ſeveral of theſe *Pillars* are little *Pedeſtals* Jetting out about the Middle of them, ſometimes one way only, and ſometimes more, which ſeem to have been the *Baſes* or Standing Places of *Statues*. On theſe *Pedeſtals* we ſaw many *Inſcriptions*, ſometimes when there was none upon the Body of the *Pillar*, and ſometimes when there were. As for Inſtance, this that follows upon the *Pedeſtal*, thus;

ϹЄΠΤΙΜΙΟΝ ΑΙΡΑΝΗΝ ΟΔΑΙΝΟΘΟΥ ΤΟΝ ΛΑΜΠΡΟΤΑΤΟΝ ϹΥΝΚΛΗΤΙΚΟΝ.

and upon the *Body* of the *Pillar*, this Imperfect one;

ЄΞΑ.....ΝΤωΝ ΑΥΡΗΛΙ.....ΡΗΛΙΟΔωΡ..... ϹΤΡΑΤΙωΤΗϹ ΛЄ..... ΚΗϹ ΤωΝ ΠΑΤΡωΝ ΤЄΙΜΗϹ ΚΑΙ ЄΥΧΑΡΙϹΤΙΑϹ ΧΑΡΙΝ ЄΤΟΥϹ Γ Ξ Φ.

We ſee they eſteem'd it very Honourable to have their Memories Preſerved after this manner: but it is but little Knowledge of them we can get from hence, ſave now and then the *Time* when they Liv'd. As here, 563 *Years* after the *Death* of *Alexander*, reach to the *Year* of *our Lord* 239.

Another *Inſcription* in the ſame *Piazza* was thus;

Η ΒΟΥΛ[Η ΚΑΙ ΟΔΗ]ΜΟϹ ϹЄΠΤΙΜΙΟΝ ΤΟΝ ΚΡΑΤΙϹΤΟΝ Є[ΠΙΤΡΟΠΟΝ Ϲ]ЄΒΑϹΤΟΥ ΔΟΥΚΗΝ[ΑΡΙΟΝ]....ЄΟΔΟΤΗΝ ΤΗϹ ΜΗΤ[ΡΟΚΟΛω]ΝЄΙΑϹ ΚΑΙ ΑΝΑΚΟΜΙϹΑ[ΝΤΑ Τ]ΑϹ ϹΥΝΟΔΙΑϹ ЄΞ ΙΔΙωΝ ΚΑΙ ΜΑΡΤΥΡΗΘЄΝΤΑ ΥΠΟ ΤωΝ ΑΡΧЄΜΠΟΡωΝ ΚΑΙ ΛΑΜΠΡωϹ ϹΤΡΑΤΗΓΗϹΑΝΤΑ ΚΑΙ ΑΓΟΡΑΝΟΜΗϹΑΝΤΑ ΤΗϹ ΑΥΤΗϹ ΜΗΤΟΚΟΛωΝЄΙΑϹ ΚΑΙ ΠΛЄΙϹΤΑ ΟΙΚΟΘЄΝ ΑΝΑΛωϹΑΝΤΑ ΚΑΙ ΑΡЄϹΑΝΤΑ ΤΗΤЄ ΑΥΤΗ ΒΟΥΛΗ ΚΑΙ Τω ΔΗΜω ΚΑΙ ΝΥΝЄΙ ΛΑΜΠΡωϹ ϹΥΜΠΟϹΙΑΡΚΟΝ ΤωΝ ΤΟΥ ΔΙΟϹ ΒΗΛΟΥ ΙЄ[Ρ]ωΝ ΤЄΙΜΗϹ ЄΝ ЄΚ ЄΝ ЄΤ..... ΞΑΝΔΙΚω.

This

This affords a ſufficient Confirmation of what I before obſerv'd, That theſe were Honorary *Inſcriptions* in Memory of thoſe that had behav'd themſelves well in *Publick Offices*; of which we have ſeveral mention'd here, whereof ſome are very well Known, but the Others not eaſy to be met with in *Books*. By the Word ΜΗΤΡΟΚΟΛωΝΕΙΑC we may be Aſſured, that though this City was Reduc'd by the *Romans* into the Form of a *Colony*, yet it had a Peculiar Mark of *Honour* ſet upon it, to Signify that it was the Chief of their *Colonies* in theſe *Oriental* Parts; that the Authority alſo of their *Senate* and *People* was Continu'd to them; And beſides, that there was a *Society* of Men, either *Curators* of the *Temple* of *Jupiter Belus* (to whom the *Temple* before Deſcrib'd perhaps was Dedicated) or Over-ſeers of the Sports and Feſtivals that were Celebrated in Honour of him, of which Sodality this *Septimius* was, when this *Inſcription* was made, a *Sympoſiarch*, perhaps their *Chief* and *Governour*. By this too we find they did not wait for the *Deaths* of thoſe they thus *Honoured*, before they provided for the Preſervation of their *Memories*: but *Famous* Men were thus *Regiſtred* for After-ages even while they were *Alive*.

Upon one of theſe *Pedeſtals* before Deſcrib'd, not far from the Former, was the following *Inſcription*; which I valu'd the more for the little Remainder it has preſerv'd of the Name of *Palmyra*, by which the Place was Known to the *Romans*.

... ΤΠΙΛΙΟΝ ΟΥΟΡωΔΗΝ [CΥΝΚΛ]ΗΤΙΚΟΝ ΚΑΙ ΒΟΥΛΕΥΤΗΝ ΠΑΛΜΥΡΗΜΟΝ ΒΗΛΑ ΚΑΒΟCΑΡCΑ ΤΟΝ ΦΙ[ΛΟΝ] ΤΕΙΜΗC ΧΑΡΙΝ ΕΤΟΥC Ο Φ.

The Upper End of this *Spacious Piazza* was ſhut in by a *Row* of *Pillars*, ſtanding ſomewhat Cloſer than thoſe on Each Side: and perhaps there might have been a kind of *Banquetting-Houſe* above, but now no certain Footſteps thereof remain. But a little farther to the Left Hand, and, it may be, Continu'd with the former *Walk*, lie the *Ruins* of a very Stately Building, which I am apt to believe might have been for ſuch an Uſe. 'Tis Built of a better *Marble*, and has an Air of *Delicacy* and *Exquiſiteneſs* in the *Work*, beyond what is Diſcernable in the *Piazza*. The *Pillars* which Supported it, are of *One Entire Stone*: and on one of them that is fallen down, but ſo Firm and Strong that it has receiv'd no Injury thereby, we Meaſur'd and found 22 *Foot* in Length, and in Compaſs 8 *Foot* and 9 *Inches*. Among theſe *Ruins* we found the only *Latin Inſcription* we ſaw in the Place, and that ſo Imperfect, there is but little of it Intelligible.

.....es Orbis & Propagatores Generis Humani D. D. N. N. Diocletianus .....ſſimi Impp. Et Conſtantius & Maximianus Nobb. Cæſ. Caſtra feliciter condiderunt.

And upon the ſame *Stone* a little lower,

.....ntes

.....ntes Oſſiano Hieroclete, V. P. Præſ. Provinciæ D. N. M. O. Eorum.

The Name of *Maximianus Herculeus*, who was *Partner* in the *Empire* with *Diocleſian*, which ſhould have follow'd in the *Inſcription*, ſeems to have been on Purpoſe ſcratcht out, and Defaced, for what reaſon I cannot gueſs. The reſt is loſt by the Breaking of the *Stone*.

In the Weſt ſide of the *Great Piazza* are ſeveral Openings for *Gates*, leading into the Court of the *Palace*: Two whereof, one would eaſily believe when they were in their Perfection, were the moſt *Magnificent* and *Glorious* in the World, both for the *Elegancy* of the *Work* in General; and Particularly for thoſe Stately *Porphyry Pillars* with which they were Adorn'd. Each *Gate* had 4, not ſtanding in a Line with the others of the *Wall*, but placed by Couples in the *Front* of the *Gate*, facing the *Palace*; two on one Hand, and two on the other: Of theſe Remain but Two Entire, and but One Standing in its Place. They are about 30 *Foot* in Length, and 9 in Circumference: Of a Subſtance ſo exceeding Hard, that it was with great Difficulty we broke off a few Shivers to bring home with us for a Pattern of the *Stone*; the *Art* of Making which, I think, is quite Loſt. We ſaw ſeveral other broken pieces of *Porphyry*, but neither of ſo accurate a Mixture and Compoſition, nor ſo Large as the Former.

The *Palace* it ſelf is ſo Entirely *Ruined*, that no Judgment can be made what it was in its Ancient Splendour, either for the Figure or Workmanſhip thereof. There is only here and there a Broken Piece of a *Wall* remaining, beat into Pieces by Violence, and conſum'd by Time to that Degree, that without the help of a *Tradition* we could hardly be well aſſur'd, that a *Royal Palace* did once fill that Space. We may gueſs however, that it *Fronted* the *Famous Piazza* before Mention'd, and was ſurrounded with Rows of *Pillars* of Different *Orders*: many of which are ſtill Standing, ſome Plain and ſome Wrought and Channell'd, as thoſe immediately Encompaſſing the *Temple*. And upon thoſe little *Pedeſtals*, which ſtood out of the Middle of ſome of them, I obſerv'd ſeveral *Inſcriptions*, but could not conveniently take more than one, which together with the *Pillar* that ſupported it was fallen to the Ground. 'Twas this,

ΜΑΡΘΕΙΝ ΑΛΕΞΑΝΔΡΟΥ ΤΟΥ ΚΑΠΑΔΗ ΤΟΥ ΟΥΑΒΑΛΛΑΘΟΥ ΤΟΥ ϹΥΜωΝΟΥ ϹΟΡΑΙΧΟϹ ΑΙΡΑΝΟΥ ΑΝΗΡ ΑΥΤΗϹ ΜΝΗΜΗϹ ΕΝΕΚΕΝ ΜΗΝΕΙ ΔΥϹΤΡω ΤΟΥ ϟ Υ ΕΤΟΥϹ.

If the reſt were of a like Nature with this, we have loſt no great matter by not taking them, this being only a *Memorial*, which a Kind *Husband* caus'd to be ſet up in Honour of his *Wife*, The Month *Dyſtrus*, anſwers to our *March*, and the *Year* 490, from the *Death* of *Alexander the Great*, the *Year* of *our Lord* 166.

I ommitted to Mention before, that Under the *Long Walk* runs a *Current* of *Hot Sulphureous* Waters, and there is a Well and other Paſſages down to them: But whatever they may have been of *Old*, they are not now ſo Convenient as another about *half* a *Mile* Weſtward from hence; where there is a very good Deſcent into the *Water*, and it is ſtill uſed by the People to *Bath* in. Near to which, upon the *Pedeſtal* of a Broken *Pillar*, (or perhaps it might be an *Altar*) Remains this following *Inſcription.*

ΔΙΙ ΥΨΙCΤω ΜΕΓΙCΤω ΚΑΙ ΕΠΗΚΟω ΒωΛΑΝΟC ΖΗΝΟΒΙΟΥ ΤΟΥ ΑΙΡΑΝΟΥ ΤΟΥ ΜΟΚΙΜΟΥ ΤΟΥ ΜΑΘΘΑ ΕΠΙ ΜΕΛΕΤΗ COΗ ΑΙΡΕΘΕΙC ΕΦΚΑC ΠΗΓΗC ΥΠΟ ΙΑΡΙΒωΛΟΥ ΘΕΟΥ ΤΟΝ Βω[ΜΟΝ] ΕΞ ΙΔΙωΝ ΑΝΕΘΗΚΕΝ ΕΤΟΥC Δ Ο Υ ΜΗΝΟC ΥΠΕΡΒΕΡΕΤΑΙΟΥ Κ.

I am pretty Confident that the Word I have markt with a *Line* under it, is Rightly taken, and therefore know not what to Gueſs it to be, unleſs the Proper Name of the *Fountain*. And upon that Suppoſition the *Inſcription* is eaſily Intelligible, ſhewing that *Bolanus*, Son of *Zenobius*, &c. being Elected Over-ſeer or Curator of this Fountain, under *Jaribolus*, Built this *Altar* to *Jupiter*, in the Year of *Alexander*, 474. *i. e.* of *our Lord* 150. and on the 20*th* of *October*, if the laſt *Kappa* be a *Numeral*, as I ſuppoſe it muſt. But who this *Jaribolus* was, on whom they beſtow, as generally upon the *Roman Emperors*, whoſe Names occur in the *Inſcriptions*, the Title of ΘΕΟC, is not ſo facile a Conjecture. They were under the *Parthians*, before the *Romans* fell in among them; but the *Date* ſhews this to be after the Time of *Hadrian*, and ſo after Their Coming. Nay, and in an *Inſcription* before mention'd, which is of a *Later Date* than this by 80 *Years*, we have the Name of the Same Perſon.

Hot Sulphureous Baths are things very frequent in this Country; and thence it was that it obtain'd the Name of *Syria Salutifera*. The Scent of the Waters here is much like thoſe of *Bath* in *England*, but not ſo Strong, neither is the Taſte ſo Offenſive: On the contrary, when they have run ſo far from the Fountain, as to become Cold, they are very Potable, and are the only Water the Inhabitants uſe.

On the Eaſt ſide likewiſe of the Long *Piazza* ſtands, if I may uſe ſuch an Expreſſion, a Wood of *Marble Pillars*, ſome Perfect, and others Depriv'd of their beautiful *Capitals*; but ſo Scatter'd and Confus'd, that it is not poſſible to reduce them into any Order, ſo as to Conjecture to what they Anciently ſerv'd. In one Place are 11 together in a . . . . Square after this manner, Pav'd at the Bottom with broad . . *Flat* Stone, but without any *Roof*, or *Covering*. And at a lit- . . tle Diſtance from that ſtands the *Ruins* of a ſmall *Temple*, . . . which by the *Remains* ſeem to have been for the Workmanſhip very Curious. But the *Roof* is wholly gone, and the *Walls* very much Defaced and Conſum'd with Time. Before the Entrance, which looks to the South, is

a *Piazza* ſupported by 6 *Pillars*, two on one hand of the *Door*, and two on the other, and at each End one. And the *Pedeſtals* of thoſe in the Front have been fill'd with *Inſcriptions*, both in *Greek* and the other *Language*; but they are now ſo Obliterated and worn out, as not to be Intelligible. The moſt Perfect was this that follows:

ΜΑΛΕΝΤΟΝ ΚΑΙΑΓΡΙΠΠΑΝ ΙΑΡΑΙΟΥ ΤΟΥ ΡΑΑΙΟΥ ΓΡΑΜΜΑΤΕΑ ΓΕΝΟΜΕΝΟΝ ΤΟ ΔΕΥΤΕΡΟΝ ΕΠΙΔΗΜΙ[Α] ΘΕΟΥ ΑΔΡΙΑΝΟΥ ΑΛΙΜΜΑ ΠΑΡΑΣΧΟΤΑ ΞΕΝΟΙΣΤΕ ΚΑΙ ΠΟΛΕΙΤΑ[ΙΣ]..... And a little below were theſe ſtraggling Letters viſible.

ΕΝΗ....Ν ΥΠΗΡΕΤΗΣΑΝΤΑ ΤΗΥ....ΣΤΡΑΤΕΥΜΑ ΤΟΥ ...ΥΠΟ.... ΗΚΑΙ.....ΤΟΝ ΝΑΟΝ ΤΟΝ.....ΔΙΟΣ....ΝΤωΥ.....

I ſhould have imagin'd ΚΑΙ to have been a Copulative, and the Second Name *Agrippa* diſtinct from the Former, but that the Words following in the Singular Number, will not admit of ſuch a Conſtruction. The Perſon then, in Memory of whom this *Inſcription* was made, muſt have been Nam'd *Malentus Cæagrippa*, who bearing ſuch an Office as *Scribe*, or the like, in the Expedition of *Adrian* the Emperor, perform'd an Act of Publick Benificence and Generoſity, both to *Strangers* and *Citizens*, denoted by the Word ΑΛΙΜΜΑ, or ἄλειμμα, which Signifies *Unction*. Perhaps he Diſtributed amongſt them *Sweet Oyls*, to be uſed in, or after their *Bathings*. 'Tis Pity what follows is ſo Imperfect; and eſpecially that we cannot find out the *Date*: For that might have Directed us to the Preciſe Time of *Hadrian*'s Expedition into theſe *Oriental* Parts, where he made great Conqueſts, and enlarg'd the bounds of the *Roman* Empire.

But as great a Curioſity as any, were their *Sepulchers*, being *Square Towers*, 4 or 5 Stories High, and ſtanding on both ſides of a Hollow Way, towards the North part of the City. They ſtretch out in Length the Space of a *Mile*, and perhaps formerly might Extend a great way further. They were all of the ſame Form, but of different Splendor and Greatneſs, according to the Circumſtances of their Founders. The firſt we viewed was entirely *Marble*, but is now wholly in *Ruins*, and nothing but a heap of broken Stones, amongſt which we found the Pieces of two *Statues*, one of a Man, and another of a Woman, Cut in a Sitting, or rather Leaning Poſture; the *Heads* and part of the *Arms* of both being broken off, but their *Bodies* remaining pretty Entire; ſo that we had the Advantage of ſeeing their Habits, which appear'd very Noble, but more approaching the *European* Faſhion, than what is now in the *Eaſt*; which enclin'd me to think they might be *Romans*. Upon broken pieces of Stone, tumbled here and there, we found ſome broken *Inſcriptions*, but not affording any perfect Senſe, they are not worth the Tranſcribing.

Many other *Sepulchers* there were, as much gone to Decay as this, which therefore we paſt by, to go to Two which ſtood almoſt Oppoſite to one another, and ſeem'd moſt Perfect of any, though not without Marks

of the *Turkiſh Malice.* They are Two *Square Towers*, rather Larger than Ordinary *Steeples*, and 5 Stories High, the Outſide being of Common Stone, but the Partitions and Floors within of good *Marble*; and Beautify'd too with very Lively *Carvings*, and *Paintings*, and *Figures*, both of Men and Women, as far as the Breaſt and Shoulders; but miſerably Defac'd and Broken. Under theſe *Statues*, or by their Sides, are in the *Unknown Character*, the Names probably of the Perſons there Bury'd, or by them Repreſented; or elſe ſome other Memorials of them. We enter'd one of theſe by a Door on the South ſide, from which was a *Walk* croſs the whole Building juſt in the Middle. But the Floor was Broke up, and ſo gave us a Sight of a *Vault* below, Divided after the ſame manner. The Spaces on each hand were again Subdivided into 6 *Partitions* by Thick Walls, each *Partition* being Capable of receiving the Largeſt *Corps*; and Piling them one above another, as their way appears to have been, each of thoſe Spaces might contain at leaſt 6 or 7 *Bodies*. For the Loweſt, Second, and Third Stories, thoſe *Partitions* were Uniform, and altogether the ſame; ſave from the 2d Floor, which anſwer'd the Main Entrance, One *Partition* was reſerv'd for a *Stair-Caſe*. Higher than this, the Building, being ſomething Contracted towards the Top; would not afford Space for the Continuation of the ſame Method: Therefore the Two Uppermoſt Rooms were not ſo Parted, nor perhaps ever had any *Bodies* laid in them; unleſs it was that of the *Founder* alone, whoſe *Statue* wrapt up in *Funeral Apparel*, and in a Lying Poſture, is placed in a *Nich*, or rather Window, in the *Front* of the *Monument*, ſo as to be Viſible both within and without. Near to this *Statue* was the following *Inſcription.*

ΤΟ ΜΝΗΜΕΙΟΝ ΕΚΤΙCΑΝ ΕΛΑΒΗΛΕCΜΑΝΝΑΙΟC COXAEIC ΜΑΛΧΟC ΟΥΑΒΑΛΛΑΘΟΥ ΤΟΥ ΜΑΝΝΑΙΟΥ ΤΟΥ ΕΛΑΒΗΛΟΥ ΑΥΤῶ ΚΑΙ ΥΙΟΙC ΕΤΟΥC Δ Ι Υ ΜΗΝΟC ΞΑΝΔΙΚΟΥ.

'Tis a little Doubtful, whether ΑΥΤῶ ſhould not rather be made ΑΥΤΟΙC; or elſe there muſt be a fault in the *Verb*, and all thoſe but the Names of One Perſon.

The other *Monument* on the other ſide of the way is very much like this; only the *Front* and *Entrance* are towards the North, and 'tis not altogether ſo Polite, nor ſo well *Painted.* but the *Carvings* are as Good, and it ſhews altogether as Stately and Magnificent as the former. Beſides, it has the Advantage in Age of a whole *Century* of *Years*: as appears from the Date of the following *Inſcription.* 'Tis plac'd above a *Nich* in the *Front*, Adorn'd with handſome *Borders* and *Corniſhes*; the Place doubtleſs of ſome *Statue*, and probably that of the *Founder.*

ΜΝΗΜΕΙΟΝ ΑΙῶΝΙΟΝ ΤΕΡΑC ῶΚΟΔΟΜΗCEN ΤΙΧΟC ΜΟΚΙΜΟΥ ΤΟΥ ΚΑΙΛΚΙΑΛCICOΥ ΤΟΥ ΜΑ ..... ΟΥ ΕΙCΤΕ ΕΑΥΤΟΝ ΚΑΙ ΥΙΟΥC ΚΑΙ ΕΓΓΟΝΟΥC ΕΤΟΥC Δ Ι Υ ΜΗΝΕΙ ΞΑΝΔΙΚῶ.

This

This is the moſt Ancient *Inſcription* I met with in *Tadmor*, the 314*th* Year from the *Death* of *Alexander the Great*, preceding the *Birth* of our *Saviour* about 10 *Years*. The other alſo is betwen 20 or 30 *Years* before the Reign of *Hadrian*, and conſequently before the *Romans* got Footing here. And from theſe Sumptuous Structures, and theſe Coſtly *Mauſolæa*, we may reaſonably Conclude, they were a Potent and Opulent People, before they became Subject to the *Romans*, and were not Oblig'd to them for their *Greatneſs*.

After 4 *Days* ſtay we Return'd, not the Way that we came, but proceeding Eaſtward towards the River *Euphrates*. In our way to which, the 3*d Day*, paſſing through a Village call'd *Teive*, upon a Stone ſet Wrong End Upwards, in the Midſt of the *Wall* of the *Moſque*, we met with the following *Inſcription*.

ΔΙΙ ΜΕΓΙCTω ΚΕΡΑΥΝΙω ΥΠΕΡ CωΤΗΡΙΑCΤΡΑ : ΑΔΡΙΑΝΟΥ CΕΒ....ΤΟΥ ΚΥΡΙΟΥ ΑΓΑΘΑΝΤΕΛΟC ΑΒΙΛΗΝΟC ΤΗC ΔΕΚΑΠΟΛΕΟCΤΗΝ ΚΑΜΑΡΑΝ ωΚΟΔΟΜΗCΕΝ ΚΑΙ ΤΗΝ ΚΑΙΝΗ.... ΕΞ ΙΔΙωΝ ΑΝΕΘΗΚΕΝ ΕΤΟΥC Ε Μ Υ ΜΗΝΟC ΛωΟΥ.

And under this was another in the ſame *Language* and *Character* we had ſeen at *Tadmor*; I was Surpriz'd to find ſuch an *Inſcription* in this Place, nor can any way gueſs howthey ſhould come by it: and the mention of *Decapolis*, makes me ſtill more in the Dark. If one might Extend the Bounds of *Decapolis*, as ſome are ſaid to have done, as far as *Cæloſyria*, and comprize under this Name again all *Syria*, *Phœnicia* only excepted, then need it not be brought from elſewhere, but firſt ſet up in this Village. But this will not be Allow'd by thoſe who make *Decapolis* only a part of *Paleſtine*. The matter of Fact it contains, is only an Account of the Magnificence of this *Agathangelus Abilenus*, whoever he was, who for the Safety of the Emperor *Hadrian*, Erected at his own Charges, and Dedicated to *Jupiter* the *Thunderer*, a *Royal Banquetting-Houſe*, (for ſo I take ΚΑΜΑΡΑ to ſignify) and a *Bed* of *State*; for after ΚΑΙΝΗ there is doubtleſs a Letter Omitted, and it ought to be ΚΑΙΝΗΝ. The *Date* 445. agrees to the Year of *our Lord* 123. which was the 7*th* of the Reign of *Hadrian*. And the *Month* ΛωΟC is our *Auguſt*.

The next Day we paſt by the *Ruins* of a Large *Monaſtery*, of the *Maronites*, as I gueſs it to have been, by an *Inſcription* we met with upon the *Capitals* of ſeveral *Marble Pillars*, which ſupported the Middle Iſle of a Handſome *Church*, which was to this Effect:

† ΕΠΙ ΕΕΡΓΙ8 ΕΠΙΕΚο. Τ8 ΕΥΝΓΕΝ˜ ΜΑΡωΝΙ8 Τ8 ΧωΡΕΠΙΕΚο.

From thence we paſt on, and came the ſame Night to *Euphrates*, and having Travell'd 2 *Days* on the Banks of that Famous River, we came to the *Tents* of the *King* of the *Arabs*, who had furniſh'd us with a Guide for our Voyage. With him we Remain'd 2 Nights, and in 2 Days Travel

vel more came back ſafe to *Aleppo*, having been but in the whole juſt 18 *Days*.

Remarks upon theſe Antiquities; *by Mr.* Edmund Halley. n. 218. p. 160.

4. The City of *Tadmor*, whoſe *Remains* in *Ruins* do with ſo much Evidence demonſtrate the once Happy Condition thereof, ſeems very well to be prov'd to be the ſame City which *Solomon* the Great King of *Iſrael* is ſaid to have Founded under that Name in the *Deſart*, both in the 1 *Kings* 9. 18. and 2 *Chron.* 8. 16. in the *Tranſlation* of which, the *Vulgar Latin Verſion*, ſaid to be that of St. *Jerome* has it, *Condidit* Palmyram *in* Deſerto. And *Joſephus* tells us, That he Built a City in the *Deſart*, and call'd it *Thadamora*; and the *Syrians* at this Day (ſays he) call it by the Same Name: but the *Greeks* name it *Palmyra*. The Name is therefore *Greek*, and conſequently has no relation to the *Latin Palma*, and ſeems rather Deriv'd from Παλμυὸς or Πάλμυς, which *Heſychius* interprets βασιλεὺς πατὴρ: or perhaps from Παλμύτης, (which according to the ſame Author) was an *Egyptian* God. Neither is the Word תדמר but תמר that in *Hebrew* ſignifies a *Palm-Tree*.

Antiquit. Jud. l. 8.

Hiſtory is Silent as to the Fate and Circumſtances of this City, during the great Revolutions in the ſeveral Empires of the *Eaſt*; but it may well be ſuppos'd, that ſo Advanced a Garriſon as this was, being above 300 *Miles* from *Jeruſalem*, continu'd not long in the Poſſeſſion of the *Jews*, who immediately after *Solomon*, fell into Civil Diſſention, and Divided their Force: So that it is not to be doubted, but that it Submitted to the *Babylonian* and *Perſian* Monarchies, and afterwards to the *Macedonians* under *Alexander* and the *Seleucidæ*. But when the *Romans* got Footing in theſe Parts, and the *Parthians* ſeem'd to put a ſtop to their farther Conqueſts in the *Eaſt*, then was this City of *Palmyra*, by reaſon of its Situation, being a *Frontier* and in the midſt of a Vaſt Sandy *Deſart*, where Armies could not well ſubſiſt to Reduce it by Force, Courted and Careſs'd by the Contending Princes. and Permitted to continue a *Free State*, a *Mart*, or *Staple* for Trade, for the Convenience of Both *Empires*, as is abundantly made out from the Words of *Appian* and *Pliny*.

De Bell. Civil. lib. 5.

Appian tells us, That *M. Antonius*, after his Victory at *Philippi*, about 40 *Years* before *Chriſt*, ſent his Horſes to Plunder the City of *Palmyra*, Pretending only that they were not ſufficiently in the *Roman* Intereſt. Ὅτι Ρωμαίων καὶ Παρθυαίων ὄντες ἔφορτοι ἐς ἑκατέρας ἐπιδεξίως εἶχον, and that being *Merchants*, they convey'd the *Indian* and *Arabian* Commodities by the way of *Perſia* into the *Roman* Territories; though the True Reaſon was their Riches: But the *Palmyrenes*, being Inform'd of their Deſign, took Care to Prevent them, and ſo eſcap'd Plunder; and this Attempt of *Antony*'s occaſion'd a Rupture between the Two Empires.

Nat. Hiſt. lib. 5.

The Words of *Pliny*, above an 100 *Years* after, do likewiſe Teſtify, that this City then Continu'd in the ſame Enjoyment of their Liberties. Palmyra *Urbs nobilis ſitu, Divitiis Soli, Atque Aquis Amœnis, vaſto undique ambitu Arenis includit Agros, ac velut Terris exempta à Rerum Natura, privata ſorte inter duo Imperia Summa* Romanorum Parthorumque, *& prima in Diſcordiâ ſemper utrinque Cura*. Whereby it appears not only

only that it was a *Common-Wealth* in the Time of *Veſpaſian*, but the Situation thereof is truly Deſcrib'd, as it were an Iſland of *Fertile Land*, ſurrounded with a Sea of *Barren Sands*. Such Spots *Strabo* tells us, were frequent in *Lybia*, and by the *Ægyptians* were call'd *Abaſes*, whence poſſibly the Name of the *Abaſſyne* Nation is Deriv'd.

With theſe Advantages of *Freedome*, *Neutrality*, and *Trade*, for near two *Centuries*, 'tis not ſtrange that it acquir'd the *State* and *Wealth* anſwerable to the Magnificence of theſe Noble *Structures*. But when the *Romans* under *Trajan* had made it appear, that there was no Compariſon between the Puiſſance of the *Parthians* and them, (*Trajan* having taken *Babylon* and *Cteſiphon*, the then Seat of the *Parthian* Empire,) the *Palmyreni* were at length determin'd to declare for the *Romans*; which they did, by Submitting themſelves to the Emperor *Adrian*, about the Year of *Chriſt* 130, when *Adrian* made his Progreſs through *Syria* into *Ægypt*. And that Magnificent Emperor being Highly Delighted with the Native Strength and Situation of the Place, was pleaſed to Adorn and Rebuild it. When, as 'tis likely, he beſtow'd on it the Privileges of a *Colony Juris Italici*, which it Enjoy'd (as *Ulpian* aſſures us): And the Inhabitants of the City, in Gratitude were willing to call themſelves *Hadrianopolitæ*, ἐπικτιδείσης τῆς πόλεως ὑπὸ τοῦ Αὐτοκράτορος, (ſays *Stephanus*.) Nor is it unlikely that many of thoſe *Marble Pillars* were the Gift of that Emperor, and particularly thoſe of the *Long Porticus*; for that none of the *Inſcriptions* are before that *Date*; And it was uſual for the *Cæſars* to Preſent Cities that had oblig'd them, with *Marble Pillars* to Adorn their Publick Buildings. Theſe here were not far to fetch, the Neighbouring Mountains affording the *Marble Quarries*: But the Magnitude of the *Porphyry Columns* is indeed very Remarkable, conſidering how far thoſe Vaſt Stones muſt have been brought by Land-Carriage to this Place; it being not known that any other *Quarries* yield it, except thoſe of *Ægypt*, which lie about Mid-way between *Cairo* and *Siena*, between the *Nile* and the *Red-Sea*: the *Stone* being very Valuable for its *Colour* and *Hardneß*, and for that it riſes in Blocks of any Magnitude requir'd. And it is a great Miſtake of thoſe who ſuppoſe it *Factitious*,

From the Time of *Adrian* to that of *Aurelian*, for about 140 *Years*, this City continu'd to Flouriſh and Increaſe in Wealth and Power, to that Degree, that when the Emperor *Valerian* was taken Priſoner by *Sapores*, King of *Perſia*, *Odænathus*, one of the Lords of this Town (which Name Occurs in ſeveral of theſe *Inſcriptions*) was able (whilſt *Gallienus* neglected his Duty both to his Father and Country) to bring a Powerful Army into the Field, and to recover *Meſopotamia* from the *Perſians*, and to Penetrate as far as their Capital City *Cteſiphon*. Thereby rendring ſo conſiderable Service to the *Roman* State, that *Gallienus* thought himſelf Oblig'd to give him a Share in the Empire: Of which Action, *Trebellius Pollio* (in the Life of *Gallienus*) has theſe Words, *Laudatur ejus* (Gallieni) *op imum factum*, *qui* Odenatum *Participato Imperio* Auguſtum *vocavit*, *ejuſque* Monetam, *qua* Perſas *Captos traheret*, *Cudi juſſit*: *quod* & Senatus & Urbs & *omnis Ætas gratanter accepit*. The ſame, in many places, ſpeaks of this *Odænathus*

with

with great Reſpect; and mentioning his *Death*, he ſays, *Iratum fuiſſe Deum Reip. credo, qui interfecto* Valeriano *noluit* Odenatum *reſervare.* But by a ſtrange Reverſe of Fortune, this Honour and Reſpect to *Odænathus* occaſion'd the Sudden Ruin and Subverſion of the City. For He and his Son *Herodes* being Murder'd by *Mæonius*, their Kinſman, and Dying with the Title of *Auguſtus*, his Wife *Zenobia*, in Right of her Son *Waballathus* then a *Minor*, Pretended to take upon her the Government of the *Eaſt*, and did Adminiſter it to Admiration: and when ſoon after *Gallienus* was Murder'd by his Soldiers, ſhe Graſp'd the Government of *Ægypt*, and Held it during the ſhort Reign of the Emperor *Claudius Gothicus.* But *Aurelian* coming to the Imperial Dignity, would not ſuffer the Title of *Auguſtus* in this Family, though he was Contented that they ſhould hold under him as *Vice Cæſaris*, as plainly appears by the *Latin Coins* of *Aurelian* on the One ſide, and *Waballathus* (which Name is often found in theſe *Inſcriptions*) on the Other, with theſe Letters, V. C. R. I M. O R; which P. *Harduin* has moſt judiciouſly Interpreted, *Vice Cæſaris Rector Imperii Orientis*, but without the Title of *Cæſar*, or *Auguſtus*, and with a *Lawrel* inſtead of a *Diadem.* But both *Waballathus* and *Zenobia* are Styl'd CEBACTOI in the *Greek Coins*, made 'tis probable, within their own Juriſdiction. Two of the *Latin* I have ſeen, and they are as Deſcrib'd, excepting the Points.

But nothing leſs than a *Participation* of the *Empire* Contenting *Zenobia*, and *Aurelian* perſiſting not to have it Diſmember'd: he March'd againſt her, and having in two Battels Routed her Forces, he ſhut her up, and beſieg'd her in *Palmyra*: and the Beſieg'd finding that the great Reſiſtance they made, avail'd not againſt that Reſolute Emperor, they Yielded the Town; and *Zenobia* Flying with her Son, was purſu'd and taken, With which *Aurelian* being Contented, Spar'd the City, and leaving a Small Garriſon, Marcht for *Rome* with this *Captive Lady*: but the Inhabitants believing he would not Return, Set up again for themſelves, and (as *Vopiſcus* has it) Slew the Garriſon he had left in the Place. Which *Aurelian* underſtanding, though by this time he was gotten into *Europe*, with his uſual Fierceneſs, ſpeedily Return'd; and Collecting a ſufficient Army by the way, he again took the City without any great Oppoſition, and put it to the Sword, with an Uncommon Cruelty, (as he himſelf confeſſes in a Letter extant in *Vopiſcus*,) and deliver'd them to the Pillage of his Soldiers. And 'tis obſervable that none of the *Greek Inſcriptions* are after the *Date* of this Calamity, which befell the City in or about the *Year* of *Chriſt* 272, as far as may be Collected, after it had been 9 or 10 *Years* the Seat of the *Empire* of the *Eaſt*, not without Glory.

In this appears alſo the Great *Utility* of *Coins* to Illuſtrate Matters of *Hiſtory*; for by them alone 'tis made out, that there was ſuch a Prince as *Waballathus*, *Vopiſcus* ſingly mentioning him by the Name of *Balbatus.* And from the ſame *Coins* it appears that *Odænathus* had the Title of *Auguſtus* 4 *Years*, and *Waballathus* 6 at leaſt; and that the *Firſt Year* of *Aurelian* was the 4*th* of *Waballathus.* And by the Teſtimony of *Pollio*, *Odænathus*

nathus was Declar'd *Emperor* of the *Eaſt*, *Gallieno & Saturnino Coſſ.* which was *An. Chriſti* 263, and Dy'd before *Gallienus*, but in the ſame Year, *viz. An.* 267, which, by the *Coins*, was the *Firſt* of *Waballathus*. He therefore immediately Succeeded *Odænathus*, and was without doubt his Eldeſt Son by *Zenobia*, and not his Grandſon, the Son of *Herodes*, as ſome Learned Men have ſuppos'd: For if *Zenobia* could not endure that *Herodes*, Son of *Odænathus* by a Former Wife, ſhould Succeed his Father in Prejudice to her Children, and for that reaſon was Conſenting to his Murther (as *Pollio* Intimates in *Herodes* and *Mæonius*) much leſs would ſhe endure the Title of *Auguſtus* in the Son of *Herodes*, and eſpecially when her own Sons were, as 'tis probable, Elder than ſuch Grandſon. So that 'tis moſt likely that *Herennianus* and *Timolaus*, whom *Pollio* reckons among his XXX *Tyrants*, might be the Younger Sons of *Zenobia*, on whom alſo out of Motherly Affection, ſhe might beſtow the ſame Titles of Honour.

But it muſt Obſerv'd, that in the *Greek Coins*, this Prince's Name is uſually written ΑΥΤ ЄΡΜΙΑC ΟΥΑΒΑΛΛΑΘΟC ΑΘΗΝΟΥ as *Triſtan* ſays, he found it upon ſeveral *Medals*: but *Patin* has the Laſt Word only ΑΘΗ. I ſhould be glad to Peruſe ſome of theſe curious *Coins*, eſpecially if found in or near *Palmyra*; but I am inclinable to believe that his True Name was *Æranes Waballathus* (as was one of his Progenitors, in the *Firſt Inſcription* of Dr. *Halifax*) though perhaps the Remoter Cities, of *Aſia* and *Jonia*, might by miſtake write it *Hermias*. And 'tis probable that ΑΘΗΝ. might be for the Firſt Letters of the Name ΟΔΗΝΑΘΟC, which in *Syriac* begun with an *Aleph*; and the Δ was with thoſe People us'd inſtead of Θ, as we ſee the *Month Xanthicus*, written Ξανδικὸς in many of theſe *Inſcriptions*, which doubtleſs was Pronounced like *D.blæſum*, or the *Saxon* Ð. Vid. *Sup.* 3.

Though this City were at that time ſo roughly treated by *Aurelian*, yet it is certain that he did not Burn it, or Deſtroy the Buildings thereof: And though *Zoſimus* on this occaſion uſes the Words Τὴν Πόλιν Κατασκάψας, yet that ſeems only to relate to his Demoliſhing the *Walls* and *Defences* of the Place; and that Emperor's own Letter extant in *Vopiſcus*, doth ſufficiently ſhew that he Spar'd the City it ſelf; and that he took care to re-inſtate the Beautiful *Temple* of the *Sun* that was there, which had been Plunder'd by his Soldiers. However the Damage then ſuſtain'd was never Retriev'd by the Inhabitants, and I do not find that ever this City made any Figure in *Hiſtory* after it: yet the *Latin Inſcription*, ſeems to intimate, as if *Dioclefian* had Reſtor'd their *Walls* within 30 *Years* after. About the Year of *Chriſt* 400, it was the *Head-Quarters* of the *Legio Prima Illyricorum*; and though *Stephanus* gives it no better Title than φρούριον, yet it appears to have been an *Arch-biſhop's See*, under the *Metropolitan* of *Damaſcus*. To ſay in what Age, or from what Hand, it receiv'd its Final Overthrow, which Reduc'd it to the Miſerable Condition it now appears in, there is no Light in any of our *Hiſtorians*; but it is probable, it Periſht long ſince in the *Obſcure Ages* of the World, during the Wars of the *Saracen* Empire; and being Burnt and Deſolated, it was never Rebuilt, which occaſions the *Ruins* to lie ſo Entire, in a manner as they were left, nei- Vid. *Sup.* 3.

ther being Uſed to other Structures on the Place, nor worth carrying away, becauſe of the great Diſtance thereof from any other City.

As to the *Geographical* Site of *Palmyra*, *Ptolemey* Places it in the *Latitude* of *Tripoly* on the Coaſt of *Syria*, and 4 *Deg.* more Eaſterly, *viz.*

Παλμύρα. οα ϛ'. λϛ.

And he makes it the *Capital* of 16 Cities in *Syria Palmyrena*, whereof *Alabis*, *Danaba* and *Evaria* were afterwards *Biſhops Sees*. *Pliny* calls it CCIII *Miles* from the neareſt Coaſt of *Syria*, and CCCXXXVII from *Seleucia ad Tygrim* near *Bagdat*, (which Numbers are erroneouſly Printed 252, and 537 in moſt *Editions*, contrary to the Authority of the *MSS.*) *Joſephus* places it *one Day's Journey* from *Euphrates*, and *ſix* from *Babylon*, which muſt be underſtood of *Horſeman's Journeys* of about 60 *Miles per Diem*, it being more than ſo much from this City to *Euphrates*. *Ptolemy* alſo mentions a *River* running by *Palmyra*, which did not appear to our Travellers, unleſs that Gut or Channel wherein they were overflow'd by the Rain-Waters were the Bed thereof; which may, poſſibly, run with a conſtant Stream in the Winter, or times of much Rain: but this, (as the Rivers of *Aleppo* and *Damaſcus* at this Day) is made by *Ptolemy* to have no *Exit*; but to go off in *Vapour*, and to be *Imbibed* by the *Thirſty Earth* of theſe *Deſarts*.

Ib. p. 168. *p.* 204. *p.* 921. The *Æra*, or Account of *Years*, obſerv'd by the *Palmyreni* in theſe *Inſcriptions*, is evidently that of *Seleucus*, call'd afterwards *Dhilcarnain* or *Bicornis*, by the *Arabians*, and by them kept in Uſe till above 900 *Years* of *Chriſt*, and not that of the *Death* of *Alexander*. This may be Demonſtrated from the *5th Inſcription* of Dr. *Halifax*, wherein *Alexander Severus* *N.* 218. is Styl'd ΘΕΟC; that is, after the Death and Conſecration of that Emperor, or after the *Year* of *our Lord* 234; and from the Name of *Julius*, who when this *Inſcription* was put up, was *Præfectus Prætorio*, (and could be no other than *Julius Philippus Arabs*, who might be eſteem'd by the *Palmyreni* as their Countryman,) it follows, that it was in the Laſt Year of *Gordian*, *Ann. Chr.* 242, or 243: And that Emperor being ſoon after Murder'd by the Treachery of this *Philip*, who Succeeded him: and his Treaſon coming afterwards to Light, 'tis not ſtrange that his Name was purpoſely Effac'd in this *Inſcription*. The *Date* thereof *An.* 554, ſhews the Beginning of this Account 311, or 312 *Years before Chriſt* Coincident with the *Æra* of *Seleucus*, which was likewiſe obſerv'd by ſeveral other Cities in the *Eaſt*.

I ſhall not undertake the part of a Critick on theſe *Inſcriptions*, but only make ſome few Remarks on them, ſuch as Occur'd whilſt they paſt through my Hands.

1. That the more ancient of theſe *Inſcriptions* Dated before the *Year* 500, do no where make uſe of *Roman Prænomina*, which yet are very Frequent in them that follow, particularly *Julius*, *Aurelius* and *Septimius*, taken up by theſe People out of reſpect to the *Emperors* that bore thoſe Names; and conſe- Halif. *Inſcrip.* 1. quently that *Septimius Odænathus* was moſt Probably the ſame, who was afterwards

terwards *Augustus*. That Name growing in Use in the Reign of *Septimius Severus*, under whom, or his Son *Caracalla*, this *Odænathus* was certainly Born. And this *Monument* being Erected by him whilst he was yet a Private Man; and he afterwards attaining the *Imperial Dignity*, it was necessary the *Inscription* of his *Tomb* (which perhaps was that Single one that was all of *Marble*) should be chang'd: Upon which occasion this Stone might be brought back into the Town, and after its Destruction, be clapt up casually over the *Little Gate-way* where now it stands.

2. ΚΑΤΕΛΘΟΝΤΕC ΕΙC ΟΑΟΓΕCΙΑΔΑ ΕΝΠΟΡΟΙΑΝ ΕCΤΗCΑΝ: *Descendentes* Vologesiada *Commercium stabiliverunt, An.* 558. *sive An.* Christi 247. Whereby it appears, that this People having had their Trade interrupted by the Wars between the *Romans* and the *Persians*, under *Gordian*, did now send an Embassy to the Court of *Sapores*, King of the *Persians*, to get it Re-establish'd, which succeeded according to their Desires. *Vologesias* was a City built by *Vologeses*, King of the *Parthians* in the Time of *Nero*, on the *Euphrates* below *Babylon*: *Ptolemy* calls it Ουολγεσιὰς; *Stephanus*, Βολογεσιὰς; *Ammianus*, Vologessia; and *Pliny* Vologesocirta. Hal. *Inscr.* 4. *Lib.* 6.

3. ΚΑΙ ΟΥΚΟΝΙCωΝΑ ΦΕΙΔΗCΑΝΤΑ ΧΡΗΜΑΤωΝ. I submtt it to the Judgment of the *Criticks*, whether this Faulty place may not be amended, by Reading it ΟΥΚ ΟΙΚΕΙωΝ ΑΦΕΙΔΗCΑΝΤΑ, *&c.* as likewise whether ΔΙCΜΑΑΧΟΥ in the same *Inscription* may not be instead of ΜΑΑΧΟΥ ΤΟΥ ΜΑΑΚΟΥ, which is the Ingenious Conjecture of that excellent Grammarian Mr. *Will. Baxter*. Hal. *Inscrip.* 5.

4. *Septimium Vorodem Procuratorem Ducenarium Augusti*, &c. ΑΡΟΑ ΠΕΤΗΝ. This Word it *Greek*, is faultily Transcrib'd; and in one Copy I have seen, the O is very small, as I suppose it on the *Stone*; which might occasion the Transcribing thereof without it in the Former Voyage: So that it is most probable, that it is the *Remains* of some other Letter almost Worn out. I conjecture it to have been ΑΡΤΑΓΕΤΗΝ, Π being taken for Γ, and that this *Septimius* was *Præfectus Annonæ*, having the Care to see that the City were sufficiently provided with Bread; which was a most necessary Officer in a Place that must needs be furnish'd with *Corn* from Abroad. And this same *Septimius*, in another *Inscription* is Styl'd . . . . . ΕΟΔΟΤΗΝ ΤΗC ΜΗΤΡΟΚΟΛωΝΕΙΑC *lege* ΚΡΕΟΔΟΤΗΝ, which should signify that he was Distributor of the Emperor's Munificence in *Flesh* to the People. These *Inscriptions* bear Date in *April An. Dom.* 267. not long before the Death of *Odænathus*, who is herein styl'd CΕΒΑCΤΟC: and 'tis not improbable but he might Institute such a Custom, as at the Publick Charge to give the People a Largess in *Flesh* on particular Days, to reconcile them to the Dominion of their Fellow Citizen. This is certain, that *Aurelian* first Instituted such a Custom of giving *Flesh* at *Rome*: The Words of *Vopiscus* are, *Idem* Aurelianus *&* Porcinam Carnem Populo Romano *distribuit*, *quæ hodieque dividitur*; which Custom continu'd till the time of *Constantine*, when (according to *Zosimus*) one *Lucian*, who had this *Office* of Distributing Hal. *Inscrip.* *Vid. Sect.* XL. 1. *Inscrip.* 2. Hal. *Inscrip.* 10.

Swine's Fleſh at *Rome*, had Intereſt enough among the People to ſet up *Maxentius* for Emperor; and *Salmaſius* aſſures us, that it was not Diſcontinu'd till the time of *Heraclius*. It will not therefore ſeem ſtrange, if I ſuppoſe *Aurelian* might find that Cuſtom at *Palmyra*, and at his Return from thence Inſtitute the like at *Rome*.

I am inclin'd to believe, that not only the 6, 7, and 10 *Inſcriptions* of Dr. *Halifax*, but alſo the 11, were in Honour of the ſame *Septimius Vorodes*, who ſeems to have been a great Favorite of *Odænathus*, and was without doubt Reſpected by the *Romans* on that Account, whom I conclude to have Effaced all the *Memorials* of *Zenobia* and *Waballathus*, inſomuch that no One appears, among thoſe many taken, that was ſet up during the 6 *Years* they Reign'd. The Name *Vorodes* ſeems the ſame with *Orodes*, which was the Name of the King of the *Parthians* that Slew *Craſſus*: and the *Perſians*, having about 40 *Years* before, expell'd the Race of the *Arſacidæ*, 'tis not Improbable but the *Remains* of that *Royal Family* might fly for Succour to *Palmyra*, and this *Vorodes* might be one of them.

Hal. *Inſcrip.* 8. 5. In Two other Copies of theſe *Inſcriptions*; the 8*th* is Read, Σεπτιμιον Αἰεφύλω Ὀδαινάθε, and not Ὀδαινόθε, as in this Copy, and perhaps ought rather to be Ὀδαινάθον, as being the *Inſcription* under a *Statue* of the ſame *Odænathus*, who is here, as well as on his *Tomb*, ſtyl'd *Illuſtriſſimus Patricius*, but without a *Date*.

Hal. *Inſcrip.* 5. & 14. 6. ΤΠΟ ΙΑΡΙΒωΛΟΥ ΘΕΟΥ. It cannot well be Doubted, but that this *Deus Jaribolus* is the ſame with what *Gruter* and *Spon* (in the *firſt* of his *Inſcriptions*) reads ΑΓΛΙΒωΛω. By the Figure of the *Idol* extant in *Spon*, it appears that this *God* was made with the *Moon* upon his Shoulders, and conſequently was the *Deus Lunus* Worſhip'd by the *Syrians*, whoſe Name in the Language of that Country, could not be better expreſs'd than by *Jarehbôl* ירח בועל *Dominus Lunus*. Whence I am induced to believe, that *Grater* miſtook it ΑΓΛΙΒωΛω for ΑΓΑΙΒωΛω, the I in the Beginning, and the lower part of the Round ſtroke of the P, being Effaced, ſo as to paſs for Γ.

By the way it is remarkable, that the Perſon, who Dedicated this *Monument*, in *Gruter* and *Spon*, is ſtyl'd Λ. ΑΥΡ. ΗΛΙΟΔωΡΟC: and the ſame Name occurs in a Broken *Inſcription* which Mr. *Halifax* omitted, as being too Imperfect. It ſtood on the Right Hand of the *Entrance* into the little *Temple*, and was thus,

ΛΟΥΚΙΟΥ ΑΥΡΗ[ΛΙ]ΟΥ - - - - - ΗΛΙΟΔωΡΟΥ ΤΟΥ

And after a Blank of 3 Lines all worn out except one ſingle O, there follow'd,

Hal. *Inſcrip.* 9. [ΤΕΙ]ΜΗC ΧΑΡΙΝ ΕΤΟΥC - - - - ΜΗΝΟC [ΑΠ]ΕΛΛΑΙ[ΟΥ]

And that Imperfect 9*th Inſcription* ſeems to have relation to the ſame Name.

ΜΑΛΕΝ

7. ΜΑΛΕΝΤΟΝ ΚΑΙ ΑΓΡΙΠΠΑΝ *lege* ΜΑΛΗΝ ΤΟΝ ΚΑΙ ΑΓΡΙΠΠΑΝ, it being written ΜΑΛΗΝΤΟΝ, with H in two other Copies I have seen, whereby the Sence is Clear'd. Hal. *Inscrip.* 15.

8. ΑΓΑΘΑΝΓΕΛΟΣ ΑΒΙΛΗΝΟΣ ΤΗΣ ΔΕΚΑΠΟΛΕΟΣ, *Agathangelus Abilenus Decapolitanus*; *Patronymicè*. There were in those Parts Two Cities known by the Name of *Abila*, to distinguish which, the one was call'd *Abila Lysaniæ*, from the Name of the *Tetrarch*: St. *Luke* c. 3. 1. and is placed by *Ptolemy* (in his *Cœlosyria*) about Midway between *Damascus* and *Heliopolis*: The other in *Judæa* call'd *Abila ad Jordanem*, describ'd by *Josephus*, in many Places, to lie over against *Jericho*, near the *Dead Sea*. *Decapolis* was so call'd from its *Ten Cities*, enumerated by *Pliny*: And with them he reckons up, among others the *Tetrarchy* of *Abila*, in the same *Decapolis*: which Demonstrates the *Abila Decapolis* and *Abila Lysaniæ* to be the Same Place. And tho' it cannot be deny'd, but that some of *Pliny*'s 10 *Cities* are not far distant from that near *Jordan*; yet it doth not appear that ever this other had the Title of a *Tetrarchy*. Here it is to be Observ'd, that what *Pliny* calls *Decapolis*, *Ptolemy* makes his *Cœlosyria*; and the *Cœlesyria*, of *Pliny*, is that part of *Syria* about *Aleppo*, formerly call'd *Chalcidene*, *Cyrrhistice*, &c. Hal. *Inscrip.* 18. Lib. 5. & 18.

What this Town of *Teibe* was anciently call'd, is not so easily Conjectur'd: but if the Numbers of *Ptolemy* may be Confided in, it is very near the Situation of a City he calls *Oriza*; and perhaps his *Adada* may be our *Soukney* and his *Ræsapha*, what is now call'd *Arsoffa*.

It is taken for granted, that *Old Aleppo* was anciently the City of *Berrhœa*, and there wants not Ancient Testimonies to prove it; which being granted, I think, I may without Scruple Conclude, that *Adrene*, mention'd in both the Voyages, is the *Ruins* of the City *Androna*; and *Esree* that of *Seriane*, both mention'd in the *Itinerary* of *Antoninus*, in the *Journey*, *à Dolicâ Seriane*. But this whole Country is laid about *half a Degree* more Southerly than it ought, by *Ptolemy*, who places *Berrhœa* in *Lat.* 36 *Deg.* For the Meridian Altitude of the Tropical Sun at *Aleppo* is found but 77 *Deg.* whence the *Lat.* 36 *Deg.* 30 *Min.* as it was observ'd there, *An.* 1680, by 3 several *Quadrants*.

By the same Observation a much greater Error is amended in the *Latitude* of *Aleppo*, in the *Rudolphine Tables* of *Kepler*, who supposes *Aleppo* to have been the Ancient *Antiochia ad Taurum*, and accordingly Places it in *Lat.* 37 Deg. 20 *Min.* wherein he is follow'd by *Bullialdus* and others; and several Maps have Copy'd the Mistake. But a much greater Use of it is, that therby we are assur'd, that the City of *Aracta*, wherein *Albatani* made his Observations was, without doubt, the same which is now call'd *Racca* on the *Euphrates*; of which Town an Account may be seen in *Rauwolf's Voyages*, and which was not many *Miles* below the Place, where our Travellers first came on the *River*: And if *Arecca* in the *Language* of this Country, relates to *Victory* (as is said above) it was doubtless, anciently the City *Nicephorion*, built by *Alexander the Great*; with which the Situation exactly agrees. Vid. *Oct.* 8.

XLI. Dr.

An Inſcription *in the Language of the* Palmyreni *by Mr.* Octavian Pulleyn. n. 228. p. 537. *Muſc.* p. 3.

XLI. Dr. *Halifax* calling at *Rome* in his Return home from *Aleppo*, *An.* 1696 enjoyn'd me to find out the *Inſcription* in the Language of the *Palmeveni* mention'd dy Dr. *Spon.* I waited upon S. *Fabretti*, Canon of *St. Peters*, and by him I was fully Inform'd to my Purpoſe. He lent me alſo a Draught of it, which I carry'd to the *Vinea Ceſarini* about a *Mile* without the *Porto del Popolo*, to compare it with the *Original*; but I found it not Exact. Wherefore I took a Wet Paper, and having firſt Clear'd the Letters with a Bodkin, laid it on the *Characters*, and Preſſing it with my Handkerchief took it off very Fair, then letting it Dry I went over it with my Pen.

Fig. 65.

On the Top of the *Cypreſs* which is upon one of the Sides of the *Marble*, there is a *Label* for an *Inſcription*, tho' nothing upon it, and juſt below it on the Left Side, part of a *Boy* appears out of the *Tree* with a *Lamb* upon his Shoulders, which is omitted in Dr. *Spon.* The *Stone* appear'd to me to have Remain'd Unmoleſted for ſome Time, becauſe from the Ground, the *Inſcription* was over-run with *Ivy*, the Wood of which had crept into the Letter, and over the *Gryphons* and *Figures* above it.

Draughts of ſeveral Inſcriptions *and* Characters *at* Perſepolis; *by Mr.* F. A. n. 201. p. 775.

XLII. 1. I have lately retriev'd ſome *Fragments* of *Papers* relating to Antique and Obſcure *Inſcriptions* at *Perſepolis*, taken in *Nov.* 1667. by Mr. *S. Flower* Agent in *Perſia* for our *E. I. Company*, who Dy'd Suddenly ſoon after, and left them Diſpers'd in ſeveral Hands.

Fig. 66, & 67.

Fig. 66, 67. Theſe Two *Characters* are Engraven on the Breaſt of two *Horſes* cut out of the Mountain of *Black-Marble* at *Noctureſtand*, diſtant a *League* from *Chahelmanare*, or the Ancient *Perſepolis*, one whereof is ſaid to be *Alexander*'s, the other *Ruſtram*'s, (a Famous Hero, ſuppos'd to have Liv'd about the time of the *Cambyſes.*) Mr. *Flower.*

Fig. 66. This *Character* hath ſome Similitude with the Ancient *Hebrew*: but the *Perſians* would have it their Own, though they underſtand not a *Letter.* Mr. *F.*

Fig. 68.

Fig. 68. Theſe Two *Lines* were writ entire on *Ruſtram*'s *Horſe.* Mr. *F.*

Fig. 69.

Fig. 69. This is the (*Arabick*) *Perſian Character* Engraven at *Perſepolis* not above 500 *Years* ſince, and is little Different from the Writing Uſed at this Day. Mr. *F.*

Fig. 70.

Fig. 70. This *Character*, whether it be the Ancient Writing of the *Gaures*, or *Gabres*, or a kind of *Teleſmes*, is found only at *Perſepolis*, being a part of what is there Engraven on *White-Marble*, and is by no Man in *Perſia* Legible, or *Underſtood* at this Day.

A Learned *Jeſuit* Father, who Deceas'd 3 *Years* ſince Affirm'd this *Character* to be Known and Us'd in *Ægypt.* Mr. *F.*

It ſeems Written from the Left Hand to the Right, and to conſiſt of *Pyramids*, diverſly Poſited, but not Joyn'd together. As to the quantity of the *Inſcriptions*, *Herbert* reckon'd in one large Table 20 *Lines* of a Prodigious Breadth. Of this ſort here are Diſtinct Papers, each of ſeveral *Lines.*

Fig. 71.

Fig. 31.

Fig. 33.

Fig. 34.

Fig. 32.

Fig. 36.

Fig. 35.

Fig. 37.

Fig. 39.

Fig. 38.

Fig. 40.

Fig. 41.

Fig. 42.

Fig. 43.

Fig. 44.

Fig. 56.

Fig. 50.

Fig. 51.

Fig. 48.

Fig. 49.

Fig. 45.

Fig. 53.

Fig. 57.

Fig. 58.

Fig. 59.

Fig. 60.

Fig. 61.

Fig. 47.

Fig. 62.

Fig. 53.

Fig. 54.

Fig. 55.

Fig. 64.

Fig. 65.

Fig. 63.

Fig. 71. This *Character* is likewiſe Engraved at *Perſepolis* of like *Antiquity*, with the Former. It has ſome Affinity with the *Syriack* and *Arabick*, and has been Pretended to be Underſtood by ſome of the *Padres*. Mr. *F.* — *Fig.* 71.

2. To the *Inſcriptions* found at *Perſepolis*, I ſhall here add the *Draughts* of part of the *Stone-Work* of that Proud Palace, given me by the Perſon himſelf that Drew them upon the Place. — *The Ruins of Perſepolis; by M. Nic. Witſen. n.* 210. *p.* 117. *Fig.* 72, 73.

XLIII. I have ſpent 3 *Months* of 1669. in a Voyage to the *Upper Ægypt*, accompany'd with my Brothers, the F. *Charles* and *Francis*, always Aſcending upon the *Nile* as High as 300 *Leagues* above *Cairo*, being 2 *Days* Journey on this ſide of the *Caſcata's* of the *Nile*. I there Admir'd ſtore of *Idol-Temples* yet Entire, together with very Ancient *Palaces* fill'd with *Statues* and *Idols*. I counted in one place alone 7 *Obelisks* like thoſe at *Rome*, and about 120 *Columns* in one *Hall*, of the bigneſs of 5 *Braſſes*; full, within and without, from the Top to the Bottom, with *Hieroglyphick Letters*, and with *Figures* of Falſe Deities. I found *Statues* of *White-Marble*; and ſome of *Black*, of the bigneſs of 3 Perſons, with a Sword on their ſide, and of an Hard Stone; namely, a *Man* and a *Woman*, at the leaſt of the Height of 8 *Fathoms*, though Seated in *Chairs*; but well Proportion'd: and Two others of *Black-Marble* Repreſenting *Women*, with *Globes* on their Heads and Extravagant Coverings thereon, which were Two *Foot* Broad from One Shoulder to the Other. — *Obſervations in Upper Ægypt; by F. Brothais. n.* 71. *p.* 2151.

We lighted not but in Two Places where *Antiquities* were to be Seen; one wherof is call'd *Lozor*, and the other *Candion*, which is a very Ancient *Caſtle*, eſteem'd by the Tradition of the Country to have formerly been the *Reſidence* of a King. Nor indeed is this Hard to believe even before one Enters into it, conſidering in the Advenues of the ſaid *Caſtle* a great Number of *Sphinxes* ſtanding in a Row, and Turning their Heads towards the *Alley*. 'Tis known that this is an *Idol* having the *Head* of a *Woman* and the *Body* of a *Lyon*, which was once a famous *Deity* among the *Egyptians*. They are Diſtant from each other about 2 *Paces*, and are 20 *Feet* Long. I Walked in 4 *Alleys* Ending at 4 *Gates* of the *Caſtle*; and for ought I know, there may be more of them, ſeeing I went but Half round the *Caſtle*, which is very Spacious. I reckon'd 60 of them on one Side of one *Alley*, and as many over againſt it; and 51 in another *Alley*; all well Meaſur'd. The *Alleys* are of the Largeneſs of a *Pall mall*: the *Gates* of the *Caſtle* are of an Extraordinary Height cover'd with moſt Excellent *Stones*. Meaſuring one, which maketh the Heighth of one of them, I found it $26\frac{1}{2}$ *Foot* Long, and Proportionably Thick. I believe, that there are above a *Million* of *Figures* in Profile, none in Front: I ſpeak of thoſe that are Graven on the *Walls* and *Pillars*. That which moſt Pleaſed me was the *Ground*, where the *Azure* and the other Colours, which are like *Enamel*, appear as Freſh as if they had been Laid on but a *Month* before. There are *Temples* ſo Spacious, that 3000 *People* may Stand on the *Roof* with Eaſe. In the ſame *Caſtle* there is a *Pond*, the *Water* whereof is *Bitter*, ſet about with Fine *Stones*. This *Water* is

ſaid

ſaid *perfectly* to *Whiten Linnen* all Alone; which I try'd not, but we Dip'd our Handkerchief in it, which kept the *Scent* of *Soap* for 4 or 5 Days.

There are a great Number of *Chriſtian Cophthes* in that Country, who have many *Monaſteries* and *Ancient Churches*, but Poor. We have Paſſed many Places, where was neither *Prieſt* nor *Church*: but only the Poor People, like *Sheep* without a *Shepherd*.

An Account of the Porphyry *Pillars in Ægypt; by Dr.* Rob Huntington. n° 161. p. 624.

XLIV. It may be (I think) taken for granted, that there is no Quarry or rather Rock of *Porphyry* in all the *Lower* Parts of *Ægypt*: For ſo far as the *Nile Over-flows*, is Perfect *Soil*; And the Boundaries of this *Over-flow* (which are never 10 *Miles* from the Channel, that I ſaw, generally ſcarce $\frac{1}{2}$ of it, and in ſome Places but a *Mile* or *two*, the *Delta*, ſtill excepted, which is Univerſally *Cover'd*, all but the *North*-ſide to the Sea, and a Little to the *Eaſt* for ſome *Miles* above *Damiata*) are Riſing Hills of *Sand*; beyond which is Perfect *Deſart*, upon the *Africk* ſide the *Lybian*: [Higher *South* I have been told, there are *Rocks* nearer the *River*, and in ſome Places Streighten it: but] Under theſe *Sands*, is a *yielding Stone*, not much harder than *Chalk*, tho' not ſo White, and very eaſily Manag'd; as at the *Mummies*, Deep Spacious Vaults which were the old *Repoſitories* for the *Dead*. And the like may be alſo ſaid of thoſe *Cells* or *Sepulchers* which are Hewn purely out of the *Rocky* Earth $\frac{1}{4}$ *Mile* on the *South* of *Alexandria*. Albeit nearer the Sea, there are *Stones* of a *Harder* kind, and with which they *Build*: but by their Mouldring away, as appears by the *Remains* of Houſes within the *Walls* of the City, 'tis plain they can't Endure the *Weather*; which is ſufficiently Corroding there: The *Iron* which once Plated their Thick Wooden *Gates* being moſtly *Eaten away*, and the Deep *Characters*, upon the ſides of theſe very *Porphyry-Pillars*, exceedingly *Defac'd*. Indeed about *Memphis*, *i. e.* by the *Pyramids*, they have a *Milder* Air; and the *Hieroglyphicks* Cut in theſe *Stones* will laſt well enough, till they ſhall be remov'd into a *Rougher*: But then they'll *Crizle* and *Scale*, as I found by ſad Experience. For having procur'd *Four Stones*, the beſt Mark'd with thoſe *Figures* of *Antiquity* I could meet with, and ſent them down to *Alexandria* in order to their Tranſportation for *England*; I found them upon my 2*d Voyage* into *Ægypt* very much injur'd, being put into the *Cuſtom-houſe-yard* (where they lie ſtill Embargo'd,) by the *Aga*. But yet farther into the Country, there are Mountains of *Harder Stone*: In the *Nitrian*, now the *Deſart* of St. *Macarius*, and not far from the Lake where the *Latroon* or true *Nitre* Incruſtates upon the Top of the Water, there are many; and ſome of them not utterly Unlike *Porphyry*. That which neareſt reſembles its *Colour*, tho' not its *Conſiſtence*, is the *Vein* that produces the *Eagle-Stone*; of which there are many in the *Bahr Batama*, a great Sandy Valley: But theſe *Stones* are of a different Complexion from *Porphyry*.

However I cannot Pronounce that there is no *Porphry* hereabours: For in the Chief *Monaſtery* of the 4, now Remaining (of 365. as many as are Days in the Longeſt Year) Dedicated to the *Bleſſed Virgin*; the two *Stones* which ſecure their Entrance, are of the Like, if not the very Same Sub-

ſtance;

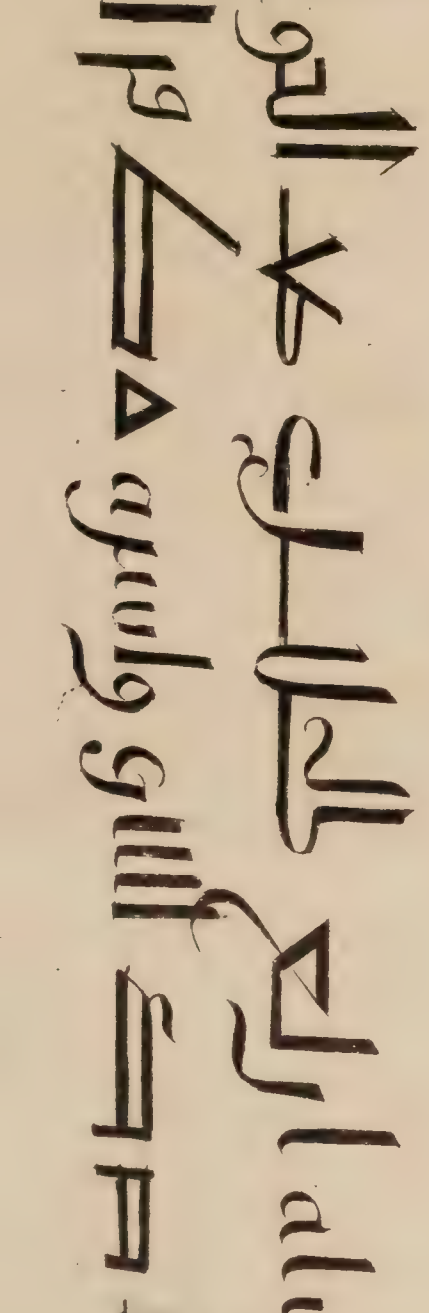

Fig. 71.

Fig. 67.

Fig. 66.

Vol. 3 Part 2, Plate 5, Pag. 528.

Fig. 70.

Fig. 68.

Fig. 69.

ſtance; which I more particularly Obſerv'd upon the Account of their Ingenious Contrivance: For theſe Poor People, lying otherwiſe at the Mercy of the Roving *Arabs*, with theſe Two *Mill-Stones* (for that's their make) thus make good their *Gate* againſt them, (or rather their Paſſage) into which they run them, and then Drive a great Wooden Wedge between them on the Inſide, which ſo Faſtens them that they cannot be Looſed, but upon the Inſide neither. And of ſuch a ſort of *Porphyry* is the noted *Sphynx* (a Mighty *Head* and *Shoulders* 110 *Feet* in compaſs) yet Standing by the *Northern Pyramids*. I have indeed been Told of the Place upon Mount *Sinai*, whence this *Porphyry* came: but ſo they Shew the very *Rock* where the two Excellent Double *Rows* of *Pillars*, in the *Church* of *Bethlehem* were Hewn; tho' I went away Satisfy'd that 'twas a quite Different Sort of *Stone*. Another Tells of a *Pillar* of the Same Make yet lying there; and if this be certain, you need ſeek no further: Albeit, I muſt tell you, that the *Stones* brought thence, with the Repreſentation of a *Buck* (it muſt needs be call'd) upon them, tho' *Reddiſh*, are of a much Finer, and more Even Texture. Father *Carlo Franciſco d' Orleans*, now Superior of the *Capucines* at *Cairo*, who went 300 *Leagues* up the *Nile* in the *Year* 1669. told me of many *Temples*, *Statues*, and *Pillars* at that Diſtance; tho' I can't be Sure he ſaid there were any of *Porphyry*. But ſince it was in *Thebais*, why may we not Suppoſe them of that Black, White and Red Speckled *Thebaic Marble*, Famous in the World; and wherewith the Leſſer *Pyramid*, perhaps was *Cruſted*, yet to be ſeen upon the Ground about it, which when Poliſh'd looks Finely.

Thoſe which I have my ſelf ſeen, are *one* of them at the *Matarea*, 3 or 4 *Miles* Eaſt of *Grand-Cairo*, and 2 at *Alexandria* juſt within the *Wall* upon the Northſide of the City: (for *Pompey's Pillar*, as they call it ½ *Mile* without the *Gate* to the South, is quite of another Make and Matter:) One of theſe is Thrown down and Broken into pieces, but was of the ſame Dimenſions for Breadth and Thickneſs with the other. The *Francks* call them *Aguglia's*; the *Engliſh* particularly *Cleopatra's Needles*: but the Inhabitants Content themſelves with the general Name of *Pillars*. They have no *Baſis* or *Pedeſtals* Above Ground; and if they ever had, they muſt needs be very Deep in the Earth. The *Stone* it ſelf is ſomething more Lively than the *Porphyry* of St. *John's Font* (for by that Name 'tis known) at *Epheſus*; much more Vivid than thoſe 4 Tall Square *Pillars* at *Tadmor* (in its middle Age *Palmyra*) which are each of them but of, I think, One Piece; whilſt all the Reſt, exceeding many, of another Sort of *Stone* are of ſeveral Pieces and Round. The Clearneſs of its Complexion may perhaps be Atributed in part to the Air, which Corrodes them eſpecially upon the *North* and *Eaſt*. The *Hieroglyphick Character*, with which they are Engraven, is perhaps the *Aboriginal Ægyptian Letter*, long ſince worn out of Common Uſe in the Country, as the *Samaritan* (ſo 'tis now generally call'd,) was amongſt the *Jews*; and bears Proportion with the *China* (now in Uſe) where each Note repreſents a Word, or rather an Entire Signification. And moreover it ſeems to be wrote the ſame way from the *Top* to the

Bottom, as may be Seen on the Board I brought from a Door in the Village *Succara* (which is next to the *Mummies*), the Largeſt piece of *Ægyptian Writing* perhaps, at this Day in *Europe*. I confeſs that in the *Vaults*, or *Prieſt's Chambers* Cut out of the Rock cloſe by the 2*d Pyramid*, the whole *Walls* are Inſcrib'd therewith; but I ſpeak of an *Original*. And if all that is there *Written* were but exactly *Copy'd*, it might be then Lawfull to Hope, that the *Language* ſo long ſince Dead and Bury'd in the Houſe of Bondage, might have its Reſurrection in the Land of Liberty.

That ſuch Vaſt *Monuments* might be Remov'd from Place to Place, is Difficult indeed, but not Impoſſible: For ſome of theſe *Mountains* are near the *Red Sea*; and *Suß* from *Cairo* is but 2 or 3 Days, from the *Nile* leſs. How Poſſible it is to Convey Mighty Weights by Water, let the *Obelisks* at *Rome* declare; which were all of them brought from this very Country: and that ſuch things May be done by Land too, tho' not by every one, is Plain enough, becauſe we ſee they have been Done. At *Baalbec*, which is 14 *Hours* from *Damaſcus* (for thence I went, accompany'd with Mr. *Ant. Balam* and Mr. *Joſ. Verney*) there is a Stone about 66 *Foot* Long on the North-ſide of the *Caſtle-Wall*, and 2 more of 60 each: And I believe we ſaw the Way they Travell'd, having left one of their Company, tho' not quite ſo Big, in the Road, as a Monument thereof to this very Day.

Explanation of the Figures. *Ib.* p. 627. & n. 178, p. 1252.

The *Draught* of One of theſe *Obelisks* was very well taken by Monſieur *Brute* a *French Druggerman*: but that of the Other, by a *Dutch Painter*, is not ſo well.

Fig. 74. *Fig.* 74. Repreſents the *Obelisk*, or *Aiguille*, near the *Matarea*: The Height of this *Pillar* is 67 *Foot*; the Bigneſs 7 ⅓ with the *Hieroglyphick Character*. *o o*, Shews the Height of the *Nile's* Riſing above the Superficies of the Earth, when it *Overflows*.

Fig. 75. *Fig.* 75. Repreſents the *Needle* at *Alexandria*.

Some Unknown Ancient Characters; *by Mr.* Flower. *n.* 203. *p.* 872.

XLV. 1. Theſe *Characters* being 22 in Number, are all that could be Diſtinctly Collected out of the *Ancient Sculptures*, to be found at this Day extant at the Admir'd Hills of *Canary*; where there are divers *Receptacles* Cut out of the Main Rock, by the Incredible Induſtry and Charge of the *Ancient Inhabitants* of thoſe Parts, ſuppoſed *Moors* or *Negroes* of *Ethiopia* rather than *Gentues*; by reaſon of the Large Proportion of their Uſual Statures, which is at leaſt 8 *Foot* in Heighth, having Great Lips, Full Eyes, Flat Noſe, and Curl'd Hair.

Fig. 76.

Vid. inf. Caſ. III.

Remarks; *by Mr.* Fran. Aſton. *p.* 873.

2. It's probable the Intent of this Paper was to Compare theſe *Characters*, being very Ancient, with them at *Perſepolis*.

Vid. Sup. Sect. XLII.

The Places here Pointed at, are chiefly 3, *Two* upon the Iſland of *Salſete*. and *One* upon the Iſland *Pory*, call'd the *Pagode* of *Olifant*, of ſuch a Bigneſs that One of them is Deſcrib'd by *Linſchoten*, to be Equal to a Village of 400 Houſes; to Conſiſt of 4 Ranges of Building, one over another, within the Mountain; and to Contain no leſs than 300 Rooms or Habitations; Adorn'd throughout with Strange Frightful *Statues* of *Idols*, *Lyons*, *Tygers*, *Elephants*, *Amazons*, and a hundred other Things, very well *Deſign'd*.

Who

Who were the *Architects* is very uncertain; *Balbi* names the *Romans*, and *Alexander the Great*; others, the *Chineses*; Mr. *Flower*, the *Abessins*, who have some Few *Churches* Cut in the *Rocks*; but *Alvarez*, who saw them Twice, says, the Country Affirms they were made by *Ægyptians*, or other *White-Men*. But though their Beginning be Obscure, their End may more easily be declar'd: for the *Portugueses* upon the Building of *Goa*, began to Destroy them, and have Continu'd to do so ever since.

XLVI. *A Paper* Omitted, *viz.*

A Dissertation of Dr. *Barrow* De *Sestertio*; Taken out of the 4*th Vol.* of his Works. n. 190. p. 384.

XLVII. *Accounts of* Books, *and* Emendations, *Omitted.*

1. INstitutionum *Chronologicarum* Libri duo; una cum totidem *Arithmetices Chronologicæ* Libellis: per *Guilielm. Beveregium*. S. Th. D. *Lond.* 1669. *in* 4*to*. n. 47. p. 956.

2. *Ægidii Strauchii* Breviarium *Chronologicum*. *Witebergæ*. *in* 12*o*. n. 50. p. 1022.

3. Abrege *Chronologique* de *l' Histoire Sacree & Profane*; par le P. *L'abbe*. S. J. *in* 5. *Vol. Paris* in 12*o*. ib. p. 1022.

4. Tabula *Mathematico-Historica*; *à* Cl. *Megerlino*, Matheseos Prof. *Basil.* n. 127. p. 667.

5. Nouvelle *Science des Temps*: ou Moyen General de Concilier les *Chronologues*; par le S. *Meynard*, Seigneur d' *Iserné*. A *Paris* in 12*o*. n. 131. p. 793.

6. *Palæologia Chronica*: A *Chronological* Account of Ancient Time: in 3 Parts; *Didactical*, *Apodeictical*, *Chronical*; By *Rob. Cary*. D. L L. *Lond.* 1677. in *Fol.* n. 132. p. 898.

7. *J. Wallisii*. S. T. D, Exercitatio de *Periodo Juliana*. *Lond.* 1678. n. 139. p. 980.

8. Quæstio Triplex de *Anno*, *Mense*, & *Die*, *Christi Nati*, *Baptizati* & *Mortui*. Auth. R. P. *Michaele Seneschallo*. è S. J. *Leodii*. 1670. in 4*to*. n. 60. p. 1085.

9. *Julius Celsus* de Vita & Rebus Gestis *Julii Cæsaris*: Ex Musæo *Joan. Georgii Grevii*. Iterata Editio. 1697. n. 222. p. 327.

10. The *Primitive Origination of Mankind*, Consider'd and Examin'd according to the *Light* of *Nature*; by Sir *Math. Hale*. *Lond.* 1677. in *Fol.* n. 136. p. 917.

11. A Letter of L' *Abbé de la Charmoye* to L' *Abbé Nicaise* concerning the *Original of Nations*. *Some Remarks on it*; *by M.* Leibnitz *and Dr.* Wallis. n. 255. p. 274. p. 273. 283.

12. *Olaii Rudbekii Atlantica*, sive *Manheim* vera *Japeti* Posterorum Sedes, ac Patria: ex qua non tantum Monarchæ & Reges, ad totum fere Orbem reliquum Regendum ac Domandum Stirpesque suas in eo Condendas, sed etiam *Scythæ*, *Barbari*, *Asæ*, *Gigantes*, *Gothi*, *Phryges*, *Trojani*, *Amazones*, *Thraces*, *Libyes*, *Mauri*, *Tusci*, *Galli*, *Cimbri*, *Cimmerii*, *Saxones*, *Germani*, *Suevi*, *Longobardi*, *Vandali*, *Heruli*, *Gepidæ*, *Teutones*, *Angli*, *Pictones*, *Dani*, *Sicambri*, aliique Virtute Clari & Celebres Populi, olim Exierunt. *Upsal.* *Ph. Col.* n. 4. p. 118. N. 255. p. 283.

n. 62. p. 2032. 13. De *Anglorum* Gentis *Origine*, Diſceptatio; Auth. *Rob. Sheringhamo. Cantab.* 1670. in 8*o*.

n. 124. p. 596. 14. *Britannia Antiqua* Illuſtrata: or, The *Antiquities* of ancient *Britain*, deriv'd from the *Phœnicians*, &c. *Vol.* I. By *Aylet Sammes*. *Lond.* 1676.

n. 209. p. 115. 15. The *Hiſtory* of the *Church* of *Malabar*, from the Time of its being Diſcover'd by the *Portuguezes* in the *Year* 1501. Giving an Account of the *Perſecutions* and Violent Methods of the *Roman Prelates* to Reduce them to the Subjection of the *Church* of *Rome*: together with the *Synod* of *Diamper*, Celebrated *An.* 1599. With ſome Remarks upon the *Faith* and *Doctrine* of the *Chriſtians* of St. *Thomas* in the *Indies*, Agreeing with the *Church* of *England*, in Oppoſition to that of *Rome*. Done out of *Portugueze* into *Engliſh*; by *Mich. Geddes*, *Chancellor* of the *Cathedral Church* of *Sarum*. *Lond.* 1694. in 8*o*.

n. 223. p. 358. 16. The *Antiquities* of *Palmyra*, alias *Tadmor*; Built by King *Solomon* in the *Deſart* of *Arabia*: Containing the *Hiſtory* of that City and it's Emperors, from it's Foundation to this Preſent Time; by *Ab. Seller.* in 8*o*.

n. 153. p. 386. 17. *Recherches Curieuſes*, &c. Curious Reſearches of *Antiquity*, Contain'd in divers Diſſertations concerning *Medals*, *Baſe-Reliefs*, *Statues*, *Moſaick-Works*, and *Inſcriptions* of the *Ancients*; by Dr. *Spon.* 1683. in 4*o*.

n. 260. p. 467. 18. Linguarum *Vet. Septentrionalium* Theſaurus *Grammatico-Criticus* & *Archæologicus*. Accedit Catalogus Librorum *Veterum Septentrionalium*, tam eorum qui Excuſi ſunt, quam qui in *Membranis Scriptis* nondum Eduntur, quam fieri licuit, Locupletiſſimus. Auth. G. *Hicks*. S. Th. D. *Oxon.* in *Fol.*

n. 198. p. 688. 19. A Treatiſe of the *Roman Ports* and *Forts* in *Kent*. By *Will. Somner*, &c. To which is prefixt the Life of Mr. *Somner*. *Oxon.* 1693. in 8*o*.

n. 220. p. 259. 20. *Parochial Antiquities*, attempted in the Hiſtory of *Ambroſden*, *Burcester*, and other Adjacent Parts, in the Counties of *Oxford* and *Bucks*; By *White Kennet*. *Oxon.* 1695. in 4*to*.

n 228. p. 538. 21. A Book of *Old Roman* and *Etruſcan Sepulchers* lately Found; by *Petro Sancto Bartoli*.

n. 166. p. 825. 22. Specimen Univerſæ *Rei Nummariæ Antiquæ*: or an Eſſay towards an Univerſal *Hiſtory* of *Ancient Coins* and *Medals*; by *Andreas Morellius*. *Paris.* 1683. in 8*o*.

n. 236. p. 57. 23. *Numiſmata*, A Diſcourſe of *Medals*, *Ancient* and *Modern*, together with ſome Account of *Heads* and *Effigies* of Illuſtrious and Famous Perſons, in *Sculps*, &c. To which is added a Digreſſion, concerning *Phyſiognomy*, by *J. Evelin*. Eſq; *Lond.* 1697. in *Fol.* *Some* Errata's *of the* Preſs *are*
n. 240 p. 204. *here* Corrected.

n. 177. p. 1242. 24. *Edvardus Bernardus*, de *Menſuris* & *Ponderibus* κατ' ἐπιτομήν. *Oxon.* 1685.

n. 179. p. 33. 25. An Eſſay towards the Recovery of the *Jewiſh Weights* and *Meaſures*, Comprehending their *Money*, by the Help of *Ancient Standards* Compar'd with ours of *England*; by *Rich Cumberland*. D. D. *Lond.* 1686. in 8*o*.

CHAP.

CHAP. III.

Voyages and Travels.

Several Observables in Lincolnshire; *by Mr.* Chr. Merret. n. 223. p. 343.

I. THat part of the County of *Lincoln* that lyeth towards the Sea, is a *Level* about 50 *Miles* long, *viz.* from *Grimsby* to *Crowland*; and Broad from the *Sea* to the *Woulds* (or *High-lands*) 10. It may be Divided first into *Marshes* extending from *Grimsbye* to about *Wainfleet*, in which are a great Stock of Large *Sheep*, which yield a very Lusty *Wool*, or of a Large *Staple* (as here phrased) 3, or 4 *Fleeces* usually making a *Tod* of 28 *Pound*. Several Hundred Loads are yearly carry'd out of it into *Northfolk*, *Suffolk*, the *North*, and *West-Countries* in great Packs (call'd *Pockets*) of about 2500 *l.* Weight, and there Manufactur'd.

2. *Fens*, the *East*, begins about *Wainfleet*, and ends at *Sibsye*, yielding a great plenty and variety of *Fowl* and *Fish*, particularly *Duck*, *Mallard*, and *Teal*, which are usually taken in *Decoys*, and sent to *London*. The *Decoy-Men* Contract for them all at a certain Rate *per Dozen*, which the Carriers (*Kedgers*) are oblig'd to take off their Hands: Two *Teal* are reckon'd equal to a *Duck*, which usually Cost here about 9 *Shillings* a *Dozen*. About *Midsummer* (when *Moultering* Time is) several Persons, some for Pleasure, others for Profit, go in small Boats among the Reeds, and with Long Poles knock them down, they not being able to Swim or Fly from them. A little before *Michaelmass*, great Flights arrive in these Parts, which soon grow Fat. When the *Decoys* are Frozen (which they keep open as long as possible, by Breaking them) the *Fowl* resort to the *Sea* for their Food. As for *Fish*, there are great Quantities, especially *Pike*, some being of a very large Size. The *Fens* abound no less with *Quadrupeds*, as *Beasts*, *Sheep* especially (which will Grow Fat) and *Horses*. These *Fens* are *Common*, so that each Town hath a Distinct *Brand*, and also each Man: There are several *Fen-Riders*, which look after them. The *Cattle*, when Used some small time in a piece of Ground, seldom leave it; so that each individual Person, may easily find his own Goods in such a large Tract. Through these *Fens* run great *Cuts* or *Dreyns*, in which are a great many *Fish*. There are also Vast Numbers of *Geese* which live on the Grass, but both Taste Rank and Muddy; but they yield Vast Quantities of *Feathers* and *Quills*; there having been 300 *Baggs*, each Weighing one *Hundred* and a *Half*, Exported from *Boston* in one Year. The Owners *Pull* them 4, 5, nay some 6 times a Year for their *Feathers*, and Thrice for their *Quills*; each *Pulling* comes to 2 *Pence*. Some Persons have 1000, and some more; they are kept at little or no Charge, except in Deep Snowy Weather, when they Feed them with Corn. Between *Spalding* and *Crowland* Grow very great Crops of *Oats* and also large Quantities of *Rapum Sylv.* (call'd *Coal Seed*) whereof they make *Oyl*, by breaking it between two great Black-Marble Stones

Stones of near a *Tun* Weight, one ſtanding *Perpendicularly* on the other (they come out of *Germany*) in *Mills*, call'd *Oyl-Mills*; ſome go with *Sails*, and Serve alſo to *Dreyn* the *Fens*, and are call'd *Engines*; being of good Uſe, and Diſcharge great Quantities of *Water*.

Theſe *Fens* lying Low, being of great Extent and receiving vaſt Quantities of Water from the High Country, makes them ſubject to *Over-flowing*; and although there be great Coſt and Skill uſed to keep them Dry, yet they are ſometimes like a Sea; Sheep having been brought out in Boats, and the Inhabitants ſupply'd in their Upper Rooms with Proviſions by them. To *Drein* them there are great *Cuts* of 20, 30, and 40 *Foot* Wide, running through them; moſt of them made by a Body of Men call'd *Undertakers*. They alſo made very Large *Sluices*; but the Country has ſince Dammed up their *Sluices*, and built New ones (call'd *Goats* and *Clows*). Some Coſt near 2000 *l.* And although made with great Skill and Strength, yet are they ſubject to be Blown up by the Vaſt Quantities and Force of Water that lyeth upon them, (eſpecially when *Over-flown*). Some have 2 or more pair of *Doors*, of 6, 8, or 10 *Foot* High, which Shut when the Water in the *River* is Higher than in the *Dreins*: and *è contra*, running ſometimes a Body of 8 *Foot* Square, for about 6 or 7 *Hours*, during the *Ebb*.

3. *Paſture-Grounds*, lying between the *Sea* and theſe *Fens*; they are very Fertile, Feeding a great Number of Fat *Oxen* and *Sheep*, which Weekly are ſent to *London* in Droves. Their *Wool* both as to Plenty and Goodneſs, much like to that of the *Marſhes*. *Tallow* here is in good Plenty, which Supplyeth *London* and other Places. Here each Town hath an *Outfall* by *Dreins*, and *Goats* to keep them dry.

Near unto the *Fens* ſtands *Boſton*, now not ſo Remarkable for *Trade*: but for the *Church*, *Steeple* and *River* may compare (probably) with any Private Pariſh in *England*. The *Church* looks like a Beautifull Princeſs among a Company of Fair Ladies, no County yielding Fairer *Churches*; and what is more obſervable, not a *Stone* fit for Building in all this *Tract*. The *Church* is very Lofty, and Ciel'd with *Iriſh-Oak*, neatly Wrought; the Body is 100 *Foot* Wide; The *Steeple* is a *Tower* of 285 *Foot* High, *Octangular* towards the Top; of Curious Stone Carved-Work, ſtanding not above 12 *Yards* from the River *Witham*; 'tis but 32 *Foot* Wide, and but 40 Long. At each *Angle* is a large *Buttereſs*; the Stones of the Sides between them, are but 7 *Inches* Thick, ſo that this Stately Curious Building ſeems to be Supported by them; it much reſembles St. *Mary's* at *Antwerp* (only wanting the Hollow *Crown-Work* and *Weather-Cock*, on the top of all) of which the Inhabitants report *Charles* V. the Emperor, ſhould ſay, That it ought to have a Caſe, and only be ſhewn on Holy-Days. Records mention the *Foundation* to be laid 9 *Foot* below the Bottom of the River. The Length of the *Church* is equal to the *Steeple*'s Height. The *Pillars* (which are very Neat and Small for their Height) *Windows* and *Stairs* are Equal to the *Months Weeks* and *Days* in a Year; from the Top of it *Lincoln* and *Lyn* may be ſeen, as alſo Ships Sailing in the Seas at a great Diſtance; 'tis a great *Land-Mark*, and may be Seen

above

above 40 *Miles* at Sea. The *River* is remarkable for good *Pike*, according to the Old Rhime,

An Ankham *Eel, and a* Witham *Pike,*
All England *cannot ſhew the like.*

As alſo for the Rapidneſs of its Stream. Of late there are *Eagers*, ſometimes endangering Shipping, without great Care, which much deſtroy its Banks and Keys, though Fortify'd with great Piles and *Jetties*, &c. So that neither Town nor Country, can ſcarcely keep it within its Banks, it often Breaking and Over-topping them: which in time is like to Ruin the Town, except aſſiſted by *Parliament*, or by taking in of the *Fen*, which might make it Flouriſh again, it being as Rich in Soil as any Ground probably in *England*. But what is moſt Remarkable, ſome *Years* 40, 50, or 100 *Tun* of *Oyl* hath been made of a Small Fiſh, call'd in Latin *Pungitius*, here *Stickle-back*, elſewhere *Prickling* or *Banſtead*, having ſmall *Prickles* on its Back, whence moſt of its Names, thereby ſcaring the Fiſh out of our River, eſpecially *Smelts*, of which we have good Plenty and Large. They are not above an *Inch* and *half* long, and about half as broad, taken in this River above the Town, for about 5 or 6 *Miles*; about a *Buſhel* are taken at a Draught, and about 8 *Chalder* will make a *Hogſhead*. They Boil by Night what were taken by Day, elſe the *Oyl* will run of it ſelf, and to Waſte.

The Sea Looſeth and Gaineth conſiderably in this County: for about *Holbeach*, *Sutton*, and *Wainfleet*, great *Marſhes* have been lately taken in; but *Northward* of *Ingold-Meals*, it hath Loſt much more. I have ſeen the *Roots* of *Trees*, that have been Dug out of the *Sands* at *Low-water*, near a *Mile* from the *Shore*, which I take to belong to *Fir*, the Bark Smelling Aromatically, and ſomewhat like that of *Fir-Timber* in Piles that have been long in Salt Water, but not near ſo ſtrong; and at *Mawplethorp*, they are often in Danger of being Drowned, their Defence being only *Banks*, or Hills of a Small Sand, call'd *Meals*, the Former *Church* having been devour'd by it.

What is further Obſervable among *Animals*, is, *firſt* of *Quadrupeds*; the Country People gather up the *Dung* of *Oxen* and *Cows*, which they Temper with Water, and Spread it on the Ground about 5 *Inches* thick, and Cut it out in Oblong pieces of about a *Foot*, and call them *Dithes*, which they uſe for Fewel. I have been credibly Inform'd, that one Perſon's Inventory of them came to 400 *l.* They alſo gather up *Hog's-Dung* and ſteep it in Water, and having well ſtirr'd it, ſtrein it, and ſo Uſe it to *Waſh* Cloaths, which when *Bleached* in the Summer, will become White and Sweet.

Beſides *Fowl* mention'd by Mr. *Cambden*, of *Mud-Suckers* (which are eſteem'd the beſt) we have *Ruff* and *Reve*, the former being the *Cock*, the other the *Hen*; in *Latin*, *Aves Pugnaces*, becauſe you ſhall ſeldom look on them but they are *Fighting*; among 100, rarely two are of a *Colour*;

Colour; they are uſually *Mewed*; they are Scarce and Dear, Uſually beſpoke by Perſons of Quality. Here are alſo, almoſt through the whole *Level*, *Swans* in their *Dreins*, which they often Feed for Preſents with Oats, each requiring Two *Strike*, *i. e.* 16 *Gallons*, here reputed but a *Buſhel*.

For *Fiſh*, here are *Turbets* in good plenty (here call'd *Brets*) taken in *Nets* Trail'd on the Ground by two Horſes; one goeth Mid-rib Deep into Sea, the other near the Shore. Here are alſo good plenty of Large *Soals*, taken in *Troul-Nets*, the *Smacks* being under Sail Trailing them along; as alſo good Store of *Scate*, which are taken by *Hooks* lying near the Shores; as are alſo *Cod* and *Thornback*.

Amongſt *Inſects*, *Gnats*, here *Midges*, are in ſome places very Troubleſome; ſome have *Nets* made of *Silk*, to ſecure them from being Bitten. *Frogs* here are in great Plenty, call'd *Holland Waites*.

As for *Vegetables*, great Quantities of *Hemp* are Sown in ſeveral places, of which Ropes are made, both for Sea and Land; the *Female* is call'd *Femble*, as alſo *Flax*: The *Seed* is broken, and *Oyl* made thereof, as of *Coal-Seed*. Our *Salt Marſhes* yield a great deal of *Kali Geniculatum*, which when Pickled is their *Samphire*, and very plentifully uſed, and far eſteem'd by them before *Crichmum Marinum*. *Carum* grows plentifully in our *Paſtures*; the *Seed* they call *Saxifrage*, which they gather and ſend to *London*. *Myrtus Brabantica*, call'd *Gall*, is uſed in ſome places to Garniſh their Chimneys. *Kirton Pippins* are here good, and in very good plenty. More Rare *Plants* are *Rhamnus Salicis Fol. Fructu Flaveſcente* C. B. *Limonium*. *Scordium*, *Petaſites*, *Lilium conval*. *Eryngium*, *Althæa*, in great plenty; *Sambucus vulg*. *Baccis in Umbellis Albis*, *Militaris Azoides*.

Theſe Parts afford but little variety of *Metals*, *Gums*, or *Stones*. *Amber* is pickt up ſometimes on the *Sands* in pretty big pieces; I have had one weighing near 6 *Ounces*. The *Aſtroites*, found at *Belvoir Caſtle*, will not only *ſtir* in *Vinegar*, but alſo *Dulcifie* it: the like will thoſe do, as alſo *Lapis Judaicus* firſt found in *England*, by my Kinſman, Mr. *Robert Jenner*, Rector of *Lyddiard Milliſcent Wilts*, in a Park belonging to Sir *Walter St. John*, near unto him.

Here *Coals* are *Charred* and then call'd *Coak*, wherewith they Dry *Malt*, giving little *Colour* or *Taſte* to the Drink made therewith. On the *Sands* the poor People ſweep together a *Black Small Subſtance* (I ſuppoſe 'tis *Coals* broken) wherewith they make *Fires*, by leaving open a *Hole* in their *Chimneys*, for the Air to Blow it; they have One on both ſide to open and ſhut as the *Wind* Sits.

What I have further to obſerve is, That *Agues* (here call'd *Holland Baylies*) are very Rife; few Strangers eſcaping without a *Seaſoning*. As alſo, That at *Spalding* there is lately a vaſt *Tunnel*, laid under the River *Welland*, carrying another under it, for *Dreining* the *Fens*. And, That between *Dunnington* and *Brigg-End*, which is about 3 *Miles*, a good *Cauſway* is carry'd through the *Fen*, having in ſeveral places Bridges for the Water to run under them; whence the Name of *Brigg-End Cauſ-way*:

'Tis

'Tis after great Rains under Water, and Paſſengers take Guides, the Bridges directing them. It was Built at the Country's Charge, who alſo Purchaſed near 100 *Pounds per Annum* to Maintain it; now under the Care of the Family of the *Shuttlewoods*. 'Tis farther obſervable, That there is a great many Hills thrown up call'd *Burrows*, mention'd by Sir *Tho. Brown* in his *Miſcellaneous Tracts*, ſuppos'd to be *Sepulchral Monuments*.

Some Years great Quantities of *Acus Major* come into our Haven: and they ſay the Freſh Water blinds them, and that they Portend Hard Winters. They run their *Beaks* into our *Ouſy Shore*; where the *Tide* leaves them, and ſo are taken up in great Quantities: they are ſaid to Eat like *Mackarel*; The Palate is ruled by the Eye, they looking like them. Our *Fen-Geeſe*, when taken up and Fed with Corn become as Good as others. After Preſſing out the *Oyl* from the *Coal-Seed*, the Remainder is call'd *Cakes*, which here they Heat *Ovens* with, and Burn for Fewel (but ſome Smell ſtrong): we Export them to *Holland*, where they Feed their *Kine* with them.

II. The *Stone* at *Cheſter*, which is ſoft Reddiſh Grit, and very Friable, with Shining Particles intermixt, is very apt to Decay with the Weather: So that all Old Buildings are very much Defac'd thereby, and the *Walls* which are Built thereof, are ſo frequently out of Repair, that they have Officers on purpoſe, whom they call *Murengers*, who do Gradually Refit them, where they are moſt Worn out. In ſome places the *Stone* is in a manner mouldred away like *Sammel Bricks* in a Wall, leaving the *Mortar* ſtanding. In theſe *Stones*, and the *Quarries* from whence they came, I have diligently ſought for *Shells*, or other *Animal Subſtances*, ſuch as are often found in other Places, but hitherto have found no ſuch things: But the *Stone* is generally Interſperſt with *Pebbles* and ſmall *Flints*, which as the *Stone* Decays, do diſcover themſelves within it, as if they had been Lodged in the *Sand*, whereof the *Stone* Conſiſts, before its *Induration*.

Obſervations at Cheſter; by Mr. Edm. Halley. n. 222. p. 318.

III. From the Top of *Snowdown-Hill* the *Sea* Dipt every where above a *Degree* below us, the *Viſible Horizon* being a *Leſſer Circle*. We ſaw *Ireland* plainly, from the W. b. S. to S.W. b. W. and then appearing in the N.N.W. and the Mountains of *Cumberland* or *Weſtmoreland* very Faintly, but evidently in the *North*; and I think we ſaw as far as *St. David's Head* into the *South*; *Carnarvanſhire* and *Angleſey* lay Under us, like a *Map*, affording a very Pleaſant Proſpect, were it not for the Horrours of the Neighbouring *Precipices*. Hence we counted 15 or 16 *Lakes*, Great and Small, where the Cavities of the Rocks are fill'd up with the *Rills* that Gleet from the Hills: all theſe are ſaid to abound with *Trouts*, ſome of which we found to be ſpecial good Fiſh. And in one of theſe *Lakes* I was on Board a *Floating Iſland*, as it may be call'd: the *Lake* is ſcarce *half* a *Mile* About, Environ'd with a Boggy Turfy Soil, a Piece of which, about 6 *Yards* Long and 4 Broad, *Floats* on the Water, being about 5 or 6 *Inches* Rais'd above it; but it is, I believe, about 18 *Inches* Deep within the Water, having

An Account of Snowdown-Hill; by Mr. Edmund Halley. n. 229. p. 566.

broad Spreading Fungous Roots on its ſides, the Lightneſs of which *Buoys* it up. It was driven on the *Lee-Shore*: but I Lanch'd it off and Swam it, to be ſatisfy'd it *Floated*. This I take the more notice of, becauſe it is deny'd to be true, by the Author of the *Additions* to *Cambden*, lately Publiſh'd. but I my ſelf Saw it as Deſcrib'd, and was Told it had formerly been Bigger; there being a Leſſer Spot, that they told us, had been heretofore a part thereof. which *Floated* likewiſe.

A little above *Llanberris* which ſtands at the *Foot* of the Hill, are the Principal *Fountains* of the *River* that falls into the *Channel* of *Angleſey*, at *Carnarvon*, call'd anciently *Segontium*.

Obſervations in Scotland; *by Mr.* Ja. Fraſer. n. 254. p. 231.

IV. Upon the North ſide of *Loch-Neß* in *Scotland*, ſtands the Famous *Caſtle* of *Urqhart* upon a Rock: the great *Ditch* round it was, for the moſt part, cut out of the Rock, and receiv'd the Water of the *Lake*. This *Caſtle* conſiſted of Seven Great Towers, and it's ſaid, was built by the *Cumines*: but had its Overthrow by King *Edward* the *Firſt* of *England*: and nothing Remains now, but one Tower to the Eaſt.

There is, due *Weſt* from the end of the River of *Neß*, an Arm of the Sea call'd *Beaulic Frith*, 6 *Miles* in Length and 2 in Breadth. This Bottom ſure has been *Firm Land* of old: for near the Middle of it we find long *Oaken Trees*, with their whole *Roots*, ſome above 60 *Foot* in Length, lying cover'd with Sand, which, no doubt, have Grown there, and lie Flat as they fell. For further Information, there are three great *Heaps* of *Stones* in this *Lake*, at conſiderable diſtance one from the other: theſe we call *Cairns* in the *Iriſh*. One of a huge Bigneſs, (in the middle of the *Frith*) at Low Water, is acceſſible: and we find it has been a *Burial Place* by the *Urns* which are ſometimes Diſcover'd. As the Sea Encroaches and Wears the Banks upward, there are long *Oaken Beams* of 20 or 30 *Foot* long Found: ſome of theſe 8. ſome 12, or 14 *Feet* under Ground. I ſaw one of them 14 *Foot* long, that carry'd the Mark of the *Ax* on it, and had ſeveral *Wimble-bores* in it. The *River* of *Beuly*, which falls into this Arm of the Sea near *Lovat*, hath ſo Sunk, that *Oaken Trees* of Incredible length, and 16 *Foot* Under-Ground, are Diſcover'd in the *Banks*, with Degrees of *Sand*, *Gravel*, *Clay*, and *Earth* Above them: And if you remember, when we went to *Beuly*, we found ſome *Oaks*, with *Coals* and pieces of *Burnt Timber*, as low as 16 *Foot*, or thereabouts.

On the Top of a Mountain, call'd *Scúre-in-Lappich*, there is a Vaſt *Heap* of *White Stones*, like *Chryſtal*, each of them bigger than a Man can Heave: they will ſtrike Fire like *Flint*, and have the Smell of *Sea-wrack*. Upon this Mountain is found alſo *Oyſter Shells* in Plenty, *Scallop* and *Limpet Shells*, yet 20 *Miles* from any Sea. Round about this Hill Grows the *Sea-pink*, in *Iriſh*, *Teartag*: It has the Taſte and Colour of that which Grows on our *Sea-Banks*.

The *Pagan Temples*, or High-Places of *Idolatry*, are ſtill very Numerous here: upon the River ſide of *Narden*, I reckon'd 13 in 2 *Miles*. They are *Orbicular* Round, and at the *Weſt-End* Two High Stones Like *Pyramids*:

there

there is an Outward and Inward Circle of Leſſer Stones, and a Round *Mote* in the *Center* for *Sacrifice*. Another Sort of them are only of *Earth*, and a *Trench* round about, and a *Mote* in the *Middle*. In many of theſe I find a Round *Heap* of *Stones*, and *Urns* in them: It ſeems a Different *Religion* afterwards Turn'd theſe *Places* of *Worſhip* into *Burial-Places*.

V. In *Scotland* one of the moſt Ordinary *Soils* for *Barley-land*, is an Earth Digg'd and Mix'd with *Beaſts-Dung*: In a place near my Dwelling there is a Plat of Ground, leſs than an *Acre*, out of which for theſe many Years paſt, Earth hath been Digg'd for the ſaid Uſe; and in *Two Years* time it will *Grow* up again, and fill the Excavated Place, ſo that it continually furniſhes *Soil* for the Adjacent Lands. Another I have in a Farm belonging to my ſelf, 20 *Miles* diſtant from this, of the ſame Nature and Quality. Both are a Stiff Clayiſh Earth, of a Dark Colour and Moiſt: It will Grow a *Foot*-High in 2 *Years*. Nothing makes our Land give better Increaſe of *Barley* than *Sea-Wrack* (*Alga Marina*): but Lands often uſed to this *Manure* yield but Bad *Oats*, and ſmall Quantity, and the Husks both of *Barley* and *Oats*, that Grow on ſuch Lands, are Thicker than thoſe that Grow on other Lands; and theſe Grains have alſo greater Mixture of *Darnel*.

Obſervations in Scotland; by Sir Geo. Mackenzy. n. 117. p. 596.

The Increaſe that ſome Places in our *Iſles* do Yield is almoſt Incredible, conſidering the *Climate* and *Soil*. For ſome will ordinarily yield 16 or *Eighteen-fold*; as very Honeſt and Credible Farmers have often Inform'd me, from their Continual Experience: And moſt of thoſe Lands that yield ſo well, are of a very *Sandy Soil*, and only *Manured* with *Sea-Wrack*. I have a Piece of Land in *Lothbroom Pariſh*, that yields every Year Plentifull Crops of *Barley*, without ever having ſo much as one Load of *Manure*, or any kind of *Addition*, laid on it: And this it hath done paſt Memory. I have ſeen Corn of it ſeveral Years; nor doth the Ground grow *Leſs*, nor is it *Exhauſted*, by yielding ſuch Plenty of Corn and Straw, though it receives no *Addition*.

There are alſo ſome Fields, that appear to be nothing elſe but a Gathering of Small *Pebbles*, inſomuch that Earth cannot well be diſcern'd amongſt them: yet do they yield abundance of good Corn, eſpecially of *Barley*; and more than Contiguous Lands that are not *Stony*.

As for our *Herbs*, I have nothing extraordinary; all I find here, are in *Hiſtory*, excepting one, which Grows on *Stony Shores*. When the *Highlanders* want *Ink*, they take the *Root* of the *Iris Paluſtris Lutea* (*Yellow Water-Flower-de-luce*) and Infuſe it 24 *Hours* in clear Fountain-Water; others Boil it a little: the Water will not be *Ting'd* to any Height. Then they take a Rough White *Pebble*, and Rub it continually in the Water on a Knife or any piece of Clean *Steel*: and in leſs than an *Hour's time*, the Water will become very *Black*, and Tolerable good *Ink*.

Our *Forreſters* alledge, that when *Deer* are Wounded, they lie on a certain Herb, which grows Plentifully in our *Forreſts*: and that by its Vertue the *Bleeding* is Stanch'd, and the Wound Healed. I did take a Quantity

of it, and Reduc'd it to a *Salve*, with Wax and Butter: Its Effect was, that it *Heal'd* too *Suddenly*. So that I durſt not adventure to uſe it in any Deep Wound: but for Superficial Scars, it hath a very ſudden Operation. I find this *Herb* to be *Aſphodilus Lancaſtriæ Verus* of *Johnſton*; or the *Lancaſhire Aſphodill*.

I cannot omit to add here, that 'tis very Ordinary to find *Molucco Beans* on the Shore of the *Lewes* or other our *Weſtern Iſles*. They are found faſt to the *Stalks*, which the Common People ſuppos'd to be *Sea-Tangles*, and Laughed at me, when I ſaid they were *Land-Beans*: Which made me write to the Earl of *Seaforth*, whilſt he liv'd in the *Lewes*, that I ſuppos'd, theſe apparent *Tangles* were the *Ham* of the *Beans*, which by long lying in the Sea, might acquire that Likeneſs: His Lordſhip examin'd the Matter, and found it ſo. And he likewiſe ſent to me a piece of a *Cabbage-Tree*, that was found on that Shore. It is obſervable that the *Kernel* of theſe *Nuts* will be *Freſh* and *Sound*: and the People make *Boxes* for *Snuff* of the *Bean-Husk*. Now, conſidering the Scituation of theſe *Iſles* with reſpect to any Place where the *Molucco-Beans* Grow, let the Obſervers of *Tides* conſider, what Reciprocations muſt be Imagin'd to adjuſt the *Eaſtern* and *Weſtern Conſtant Currents* of the Main, with the Wafting of theſe *Beans* on Places that lie ſo far out of the *Road* of any of the *Direct Tides*. And if they Grow only about the *Molucco Iſles*, or on No Place on this ſide the *Equator*, it would ſeem more Probable, that they came by the *Northern Paſſage*, than any other way. And their *Freſhneſs* in the *Kernel* ſeems rather to have been kept in a Cold Conſervatory, than in the Warm Baths of the other Progreſs.

Strange Beans *frequently caſt aſhore on the* Orkney's; *by Dr.* H. Sloan. n. 222. p. 298.

VI. I have ſeveral times Heard of *Strange Beans* thrown up by the Sea on the *Iſlands*, on the *North-Weſt* parts of *Scotland*, eſpecially thoſe of them, who are moſt expos'd to the Waves of the *Great Ocean*; they are thrown up pretty frequently in great Numbers, and are no otherwiſe regarded than as they ſerve to make *Snuff-Boxes*. Dr. *Geo. Garden* hath lately ſent me 4 *Sorts* of them very Freſh and Little Injur'd by the Sea.

The *Firſt* is what is call'd at *Jamaica* commonly *Cocoons*; by me, *Phaſeolus Maximus Perennis*, Folio Decompoſito Lobo Maximo Contorto. It grows in Both the Hot *Eaſt* and *Weſt-Indies*. This, I am told, is alſo caſt up on the Coaſt of *Kerry* in *Ireland*.

The *Second Sort* is what in *Jamaica*, we call commonly the *Horſe-Eye-Bean*. from its Reſemblance to the Eye of that Beaſt, by means of a *Hilus*, or *Welt*, almoſt ſurrounding it. This likewiſe is common to the Hot Parts of the *Eaſt* and *Weſt-Indies*.

The *Third Kind* is that which in *Jamaica* is call'd *Aſh-Coloured Nickar*, from its being perfectly Round and very like a *Nickar*, ſuch as Boys uſe to Play withall. This is likewiſe Common to the Hot Parts of the *Eaſt* and *Weſt-Indies*.

The *Fourth Sort* of theſe *Beans* I never ſaw Grow, but I have ſeen ſeveral of them in *Collections* of *Rare Fruits*. It is the *Fructus Exot. Orbicularis Sulcis*

Sulcis Nerviſque diſtinctus 4. *ſeu Fructus alter Splendens* 4. *Sulcis diſtinctus.* C. B. Where it Grows Authors are Silent.

It is Eaſy to Conceive that the *Beans* Growing in *Jamaica* in the Woods, may Fall from the Trees into the *Rivers*, and be Convey'd by them into the Sea; it is likewiſe Eaſy to Believe, that being got to Sea, and Floating in it in the Neighbourhood of that *Iſland*, they may be carry'd from thence by the *Wind* and *Current* which is there Conſtantly *Eaſt*, and which Meeting with a Stop on the Main Continent of *America* is forced through the *Gulf* of *Florida*, or *Canal* of *Bahama*, into the *N. American Sea*, for the *Lenticula Marina Serratis Foliis*, *Lob.* or *Sargaſſo*, Grows on the Rocks about *Jamaica*, and is carry'd by the *Winds* and *Current* (which for the moſt part go Impetuouſly the ſame way) towards the Coaſt of *Florida*, and thence into the *Northern American Ocean*, where it lies very Thick on the Surface of the Seas. But how they ſhould come the reſt of their *Voyage* I cannot tell, unleſs it be thought Reaſonable that theſe *Beans* being brought *North* by the *Current* from the *Gulf* of *Florida*, are put into the *Weſterly Winds* Way which generally Blow at leaſt *Two* parts of *Three* of the *Whole Year*, and may be ſuppos'd by this means at laſt to arrive at *Scotland*.

By the ſame Means that theſe *Beans* come to *Scotland*, it is reaſonable to Believe that the *Winds* and *Currents* brought from *America* thoſe ſeveral things towards the *Azores* and *Porto Santo*, which are Recorded by *Fernan. Colon*, in the Life of his Father *Chriſtopher*, to be ſome of the Reaſons that mov'd the ſaid *Chriſtopher Columbus* to attempt the Diſcovery of the *Weſt-Indies*. *Cap.* 9.

VII. *Hirta* lies from *Snod* in *Skye-Iſland*, W. b. N. From the neareſt Land to it in the *Hereiſch* (from whence People ordinarily take Boat) it lies due *Weſt*; and is about 50 *Miles* from the Neareſt Land. *A Deſcription of the Iſland* Hirta; *by Sir* Rob. Moray. n. 137. p. 927.

There are 3 *Iſlands* together, *Hirta*, *Soa*, and *Eurra*; but *Hirta* only is Inhabited. The other *Two* are excellent Paſturage for Sheep, every *Sheep* there having 2 *Lambs* every Year.

In *Burra* there is no *Landing*, but to the Men of *Hirta* only, in regard of the difficulty thereof; there being but about a *Foot* broad of *Landing-place*, and that only to be attempted when the Boat Riſes. For their ordinary way is, when they come near the Rock, they Turn their Boat, and ſet the ſide to the Shore, Two Men, one at each end of the Boat, with Two long Poles keeping it off, that the Waves Daſh it not ſo Violently againſt the Rock, when it Riſes; at which Time only the Fellow, who is to Land, makes his Attempt. If he Miſs his *Landing-place* he Falls into the Sea, and the reſt of the People Hale him a-board; he having before a ſmall Rope faſten'd about his Middle to Prevent that Danger. But when he ſafely Lands, (which they ſeldom miſs to do) the reſt of his Fellows Land one by one: except ſo many as they leave to attend their Little Boat, which ordinarily is of 16 Oars.

If there be any *Strangers*, (as many go from the Neareſt Iſlands in Summer) they muſt be Ty'd about the Middle with a Strong Rope: and when the Men of *Hirta* have Climb'd up to the Top of the Rock (which is above

24 *Fathom*

24 *Fathom* before they ſet their Foot on Graſs) they Hale up the Strangers to them with the Ropes. When they have Gather'd as many *Eggs*, and Kill'd as many *Fowls*, as will load their Boat, they Lower all into the Boat, and the Ableſt Fellow is always left behind; who having none to help him, muſt Throw himſelf into the Sea, and ſo recover the Boat. This *Burra* lies from *Hirta* about 6 *Miles Northward*.

Soa lies near *Hirta*, on the *South Weſt*. In this, except *Fowls*, there is only remarkable a *Creek*, where great *Seals* Haunt. The People are ſo Mad, that they go in their Boat, about 4 of them, in that narrow Paſſage, to Kill theſe *Seals*, with Poles; having ſcarce Room for their Oars, and every where ſeeming to Cloſe up the Mouth thereof. If the Wind Changeth, during their being there, it is not poſſible to ſave either Man or Boat.

There are ſeveral *Rocks*, Riſing out of the Sea, amongſt theſe *Iſlands*, which the People of *Hirta* call *Stacks*: ſome 10, 20, 24 *Fathoms* above Water, without any *Graß* upon them. On the round Tops of the *Rocks* a great Number of *Fowls* Breed, and in all the Cliffs. Amongſt the reſt there is One call'd *Stacka Donna*, upon the Top whereof Breedeth ſuch an abundance of *Fowls*, that though it ſeems Inacceſſible, yet the Men of *Hirta* have ventur'd to go thither. After they have Landed with much difficulty, a Man having room but for one of his *Feet*, he muſt climb up 12, or 16 *Fathoms* High. Then he comes to a Place, where having but room for his Left Foot and Left Hand, he muſt Leap from thence to ſuch another Place before him; which if he Hit right, the reſt of the Aſcent is Eaſy: and with a ſmall Cord, which he carries with him, he Hales up a Rope, whereby all the reſt come up. But if he Miſſeth that Footſtep (as oftentimes they do) he falls into the Sea, and the Company takes him in by the ſmall Cord, and then he tries it again.

Hirta Iſland is Two *Miles* in Length, accounted *Five-penny-Land*. In it there are Ten Families. The *Men* ſeldom grow Old; and ſeldom was it ever known, that any *Man* Dy'd in his Bed there, but was either Drown'd or Broke his Neck. They are Strong, Big, and Well-Skinn'd. Their Food is only Young *Fowls* and *Eggs*; their Drink *Whey* and *Water*. They are much given to keeping of *Holy-Days*; having a number of little *Chappels*, where ſometimes they Watch whole Nights, making Merry together with their Offerings.

The moſt Service of their *Women* is to Harrow their Land: which they muſt do, when their *Husbands* are Climbing for *Fowls* for them.

Their ordinary way of Dividing their Land, is one *Half-penny* to every Family. The *Rocks* alſo are divided, ſuch and ſuch on every *Half-Penny*. And there is a kind of *Officer* left by the Maſter of the Iſland, who Governs in his Abſence, and ſo Regulates, that the Beſt *Climbers* and Worſt are Mix'd together, that ſo none of the Land be Unlabour'd; that is, that all the Shelves of the Higheſt Rocks be ſearch'd for *Eggs*.

The way of their *Climbing*, when they Kill their *Fowls*, is thus; They go Two and Two with a Long Rope, not made of *Hemp*, but of *Cow-Hides*

Salted

Salted, and the Thongs cut round about, and Plated 6 or 9 Fold. Each End of the *Rope* is ty'd about each one of their Middle, and he that is fore-moſt goes till he comes to a Safe Standing; the other ſtanding Firm all that time, to keep him up in caſe his Foot ſhould have ſlip'd: when the fore-moſt is come to a Safe Standing, then the other goes, either Below or Above him, where his Buſineſs is; and ſo they watch time about; ſeldom any of them being Loſt, when this is obſerv'd.

The aforeſaid *Officer*, when any Couple is to be *Marry'd*, brings them to one of their *Chappels*, and Adminiſters an *Oath* to them; ſo they are *Marry'd*. Their *Children* when they come to the Age of 15 or 16, or thereabout, come with the Maſter of the *Iſle* to the *Hereiſch Iſland*, and are there *Baptiz'd*.

An ordinary way of Killing the *Fowls* in the Miſt is this, ſome of theſe Fellows lie beſide the Door of the little Houſes they have in their *Iſlands*, Flat upon their Backs, and open their Breaſts: which when the *Fowls* perceive, they Sit upon them, and are preſently catch'd, and their Necks Broke. One Fellow has Kill'd *Hundreds* of *Fowls* in One Night after this manner.

Sometimes they ſet *Grins* on the very Top of the Higheſt Rocks, and make them Strong for *Great Fowls*. One being ſetting of theſe *Grins*, as he was Walking along his Great Toe was Catch'd in one of them, which made him ſtumble and fall down: yet the *Grin* being Faſt and Strong, kept him Hung with his Head downward, till thoſe that Miſs'd him came in the Morning, and found him ſo Fallen.

VIII. 1. All the Tribes of *Fowls* are obſerved to have their *Sentinels*; eſpecially in the Night: the *Watchfulneſs* of the *Scart* is true to a Proverb. I have known one, who by ſurprizing the *Sentinel*, catched 300 in a Night.

Obſervations in the North Iſles *of* Scotland; *by Mr.* Martin Martin. n. 233. p. 727.

2. The want of *Rain* at the uſual time of laying *Eggs*, hinders the *Sea-Fowls* from laying for ſome Time.

3. If the *April-Moon* goes far in *May*, it Hinders the *Sea Fowls* from laying 10 or 12 days longer than is ordinary.

4. A Poor Man of *Rowdill*, in the Iſle *Harries*, notarily known by the Name of *St. Clements Blind*, though his ſight ſerved him to Travel alone through all *Harries*, *Skie*, &c. Yet he was ſtruck *Blind* (which confin'd him to his Bed) *Two Dayes* before the *New-Moon*, at which Inſtant he Recovers his *Sight*. In this he never Erred once in his Life-time, for which he was called the *Infallible Almanack*.

5. The *Children* of *Ferintoſh* in *Roſs*, are taught from their Infancy to Drink *Aquavitæ*, and are obſerved never to have any *Worms*.

6. Many in the *High-lands*, who pretend not to any Skill in *Chirurgery*, do venture to Cut the *Uvula* off when they are Troubled with it, and Preſcribe for a Remedy thereafter a piece of Bread and Cheeſe: Which is attended with good Succeſs, without Hindring the Speech.

7. In many of the *Iſles*, the Commons apply *Spearewort* for *Pains* of the *Head*; it being Bruiſed and Applied, it Raiſes a *Bliſter*, from which Iſſues much

much Matter, and this they find very Effectual for *Pains* in the *Eyes*, *Head Arm*, or *Leg*.

8. They do likewise Beat the *Juice* out of it, which they Drink for *Purging*: which they do frequently with Good Success, and to Prevent *Excoriation* of the *Throat*, they Drink a little *Melted Fresh Butter*.

9. *Anna George*, who continued in the State of *Virginity* till the 51 *Year* of her Age (as is evident by her Declaration on her Death-Bed) Married and brought forth a Boy in the 52 *Year* of her Age, having 2 *Teeth* in his Head.

10. Another Woman in *Lewis*, was 7 *Years* bringing forth a *Child*, *Bone*, after *Bone*, and all by the *Fundament*.

11. A *Boy*, in the Isle of *Skie*, Aged 16 *Years*, has a faculty of Erecting his *Ears* at his *Pleasure*. There are several Towns in *Skie*, where the *Sheep* have no *Marrow*; all these Towns are *Rocky*, *High*, and very *Windy*.

12. The Inhabitants of St. *Kilda*, are every Summer Infected with a *Cough* upon the *Chamberlan's* Landing, which lasts for 10 or 12 *Days*, and the usual Remedy for it is *Giben* Drunk upon *Brochan* of Meal and Water. This *Giben* is the *Fat* of *Sea-Fowles* Preserved in the Stomach; a Sovereign Remedy for *Coughs* and *Green Wounds*.

Several Things in Ireland *in Common with the* West-Indies; *by Dr.* Tho. Molineux. *n.* 227. *p.* 507.

IX. That there is a sort of Alliance between *Ireland* and the *West-Indies*, appears in several things, of which they partake both *in Common*. For as they on the Coast of *New England* and the Island *Bermudas* gather considerable Quantities of *Ambergriese*; so on the *Western* Coast of *Ireland*, along the Counties of *Sligo*, *Mayo*, *Kerry* and the Isles of *Arran*, they frequently meet with large Parcels of that Precious Substance, so highly valued for its *Perfume*. In the *Year* 1691. Mr. *Constantine*, an Apothecary of *Dublin*, shewed me one piece of *Ambergriese* found near *Sligo*, that weighed 52 Ounces. On the outside 'twas of a close Compact Substance, Blackish and shining like *Pitch*: But when it was cut the inside was more Porous, and something of a *Yellowish Colour*; not so Grey, Close and Smooth as the Cleanest and Best sort of *Amber*, but like it speckled with Whitish Grains, and of a most fragrant Scent. I have still a piece of it by me, that weighs above 6 *Drams*, with several samples of 3 or 4 other sorts of *Amber*, all found on that Coast of *Ireland*; some entirely Black as Pitch, others of a perfect White Substance, exactly answering the Description of that sort of *Amber*, *Olaus Wormius* mentions in his *Musæum*, under the Name of *Ambræ Griseæ nondum maturæ*.

p. 34.

Nor is the Kind of *Whale-Fish*, that's often taken in *New-England*, and affords the true *Sperma Ceti*, a Stranger to the Coast of *Ireland* that respects *America*. This we may properly, I think, with Dr. *Charleton* call the *Cetus Dentatus*, from its large, Solid, White Teeth, fixt only in the *Lower Jaw*, to Distinguish it from that Species that gives the *Whale-Bone*, most naturally named, by *Aristotle*, *Mysticetus*, from its Bearded, Horny *Laminæ* in the *Roof* of its *Mouth*: of which Kind likewise there have been 3 or 4 stranded in my time, but on the *Eastern Coast* of this Country that regards *England*.

Hist. Animal.

This

This *Cetus Dentatus* is truly *Figured* by *Johnſtonus* and Mr. *Ray*. There have been *Three* of this Kind taken to my Knowledge, in the ſpace of 6 *Years*, all on the *Weſtern* Coaſt of this Country; one near *Colerane*, in the County of *Antrim*; another about *Ship-harbour*, in the County of *Donnegall*; and a 3*d.* in *Aug.* 1691. 71 *Foot* long, towards *Bally-ſhannon*, where *Lough-Erne* diſcharges its Waters into the *Weſtern Ocean*. *Hiſt. Piſc. Tab.* 42. *Ichthyogr. Tab.* 2.

And then it was, I had an Opportunity of truly Informing my ſelf what ſort of Subſtance *Sperma Ceti* is, and in what part of the *Whale* 'tis found: concerning which Matter, *Phyſicians* and *Naturaliſts* have given the World ſuch Various and Falſe Accounts. 'Tis Truly nothing elſe but part of the *Oyl*, or *Liquid Fat*, of this particular Sort of *Whale*: which *Oyl*, at firſt, when Confus'd and Mixt, ſhews it ſelf like a *Whitiſh Liquor*, of the Conſiſtence and Colour of Whey, but laid by in Veſſels to Settle, its parts by Degrees Separate, that which is Lighter, and Swims a Top, becomes a Clear *Oyl*, Pellucid like Water, Serviceable for all the Uſes of common *Train-Oyl*, got out of the *Blubber* of other *Whales*, and that which Subſides, becauſe 'tis Heavier and of a Cloſer Conſiſtence, Candies together at the Bottom; and is what is ſold for *Sperma Ceti*, at 12 *Shil.* the *Pound*, when 'tis throughly Blanch'd and Refin'd from all its Filth, and the remaining parts of the *Oyl*, that otherwiſe Diſcolours it, and gives it a Rancid Offenſive Scent. Of this Subſtance ſeveral *Hundred Pound* Weight may be gotten out of one *Whale*, but the Cleanſing and Curing of it is Troubleſome, and requires no Small Art, Time, and Charge: which occaſions the Value of that which is thoroughly Refin'd. The *Fat* of the whole Body affords it: but that of the *Head* gives the greateſt Quantity and Pureſt *Sperma Ceti*.

I have ſome reaſon to believe, that to theſe Inſtances of *Amber-Grieſe* and *Sperma Ceti* (beſides thoſe of the *Mooſe-Deer*, (the *Horns* whereof are frequently found *Under-Ground*, and were formerly Deſcrib'd), of which *Ireland* partakes more than any other Country of *Europe*, from its Neighbourhood with the *Northern America*, we may likewiſe add ſome of our more Rare Spontaneous *Plants*: becauſe they are found Growing only in thoſe *Weſtern* Parts of *Ireland*, and no where elſe in the whole Country, or any of the Neighbouring Kingdoms about us. I ſhall mention but 2 or 3 of many which I have been told are peculiar to thoſe Parts: and thoſe are the *Arbutus ſive Unedo*, or the *Strawberry Tree*; not to be found any where of *Spontaneous* Growth nearer than the moſt Southern Parts of *France*, *Italy*, and *Sicily*, and there too 'tis never known but as a *Frutex* or *Shrub*. Whereas in the Rocky Parts of the County of *Kerry* about *Lough-lane*, and in the *Iſlands* of the ſame *Lough*, where the People of the Country call it the *Cane Apple*, it Flouriſhes *Naturally* to that Degree, as to become a Large Tall Tree. *Petrus Bellonius* takes notice, that it does ſo in Mount *Athos* in *Macedony*; and *Juba* is quoted by *Pliny*, as mentioning a Thing extraordinary, for ſaying the *Arbutus* grows to a High Tree in *Arabia*. The Trunks of thoſe in *Ireland* are frequently 4 *Foot* and a *half* in Circumference, or 18 *Inches* in Diameter, and the Trees grow to about 9 or 10 *Yards* Vid. Vol. II. Cap. III. Sect. XXXVI.

Yards in Height: and in ſuch Plenty that they now Cut them down, as the chief Fuel, to Melt and Refine the Ore of *Silver* and *Lead-Mines*, lately Diſcover'd near the *Caſtle* of *Roß*, in the County of *Kerry*.

The Other *Plant* I ſhall take Notice of is *Cotyledon, ſive Sedum Serratum Latifolium Montanum Guttato Flore Parkinſoni & Raii*, vulgarly call'd by the Gardeners *London-Pride*: I ſuppoſe becauſe of its pretty elegant *Flower*, that view'd near at Hand and examin'd cloſely, appears very Beautiful, conſiſting of great Variety of Parts. The whole Plant is moſt Accurately deſcrib'd by that Profound Naturaliſt Mr. *Ray*: But he knew no certain Place where it Grew *Spontaneous*, not having met with it in all his Travels; nor any Author mentioning its Native Country. It Grows plentifully here with us in *Ireland*, on a Mountain call'd the *Mangerton* in *Kerry*, 6 or 7 *Miles* over, and reputed the Higheſt in *Ireland*, 2 *Miles* from the Town of *Killarny*, and 4 *Miles* from the *Caſtle* of *Roß*: Here it Spreads it ſelf ſo abundantly, as to Cover great part of the Mountain, and, foraſmuch as I underſtand, like the *Arbutus*, 'tis peculiar to this County alone.

Whether both the foregoing *Plants* are truly *American*, I cannot at preſent Determine: but this I know, that *Sabina Vulgaris*, or common *Savin*, is mention'd by Mr. *Joſſelyn*, as a Plant Common on the Hills of *New-England*; and I have been aſſur'd by an Apothecary of *Dublin*, that he has gather'd *Savin* growing Wild as a *Native Shrub* in one of the Iſlands of *Loughlane*, in the County of *Kerry*; and if ſo, I have reaſon to believe, that hereafter farther Inquiry may add to theſe I have here given, ſeveral other Examples of things *Natural* and *Common* to *That* and *This Country*.

New-England Rarities.

Obſervations made in a Voyage from England to the Caribbee Iſlands; by Dr. Stubbs. n 27. p. 493.

X. 1. I took notice at *Deal*, where I ſet Sail for *Jamaica*, of the great Difference in the *Ruſting* of *Iron*, in ſuch Houſes as Front the *Sea*, in compariſon of that Effect in the Street immediately placed behind that other, in which I made this Obſervation. They told me, that it *Ruſted* more at *High Floods* than at *Neap-Tides*: the Height of the *Beach* hindring the *Saline Exhalations*. This Remark put me in mind of the Vanity of the Argumen of M. *Ligons* and others, *viz.* That the *Air* of the *Weſt-Indies* was *Hot* and *Moiſt*, becauſe of the *Ruſting* of *Iron*; whereas it indeed ariſes from ſome Other Principle in the *Air*, for at the *Point* of *Cagua*, where it ſcarce Raineth 40 Showers in a *Year*, *Iron Ruſts* as much or more than any where; yet are their other Parts of the *Iſland*, in which of 9 *Months*, not One paſſes without great Rain. Beſides, in *Jamaica* it Ruſts leaſt in *Rainy* Weather.

The *Steams* of the *Sea* are found of ſuch a Nature, that our Sweat-meats Rotted; *Sugar* of *Roſes*, and other *Lozenges* grew Moiſt; and thoſe *Pyes* and *Gammons* of *Bacon*, whnich had kept well before, after they had been once Expos'd to the Ope *Air*, *Decay'd* more in a *Day* or 2, than in 6 *Weeks* before.

On

On the *Point Cagua*, the *Iron Guns* of the *Fort* were ſo *Corroded*, that ſome were near become Uſeleſs; being perforated almoſt like Honey-Combs: But the *Guns* which lay in the *Salt-Water*, were not much Endamag'd by *Ruſt*, as we found upon Taking up of ſome.

Many things receive Dammage by the *Air*: Not only *Iron* Ruſts, but even *Linnen* Rots, and *Silks* once expos'd to the *Air* do Rot without loſing their *Colour*. If a *Lancet* be once Expos'd to the *Air*, it will *Ruſt*, though you preſenly put it up again: but if it be never Expos'd to the *Air*, it will hardly *Ruſt*.

At *Deal* a certain *Ale-Seller* will warrant, that the *Ale*, as he orders it, ſhall be carry'd good to the *Weſt* or *Eaſt-Indies*. His way to prepare it is this, (as he told me himſelf,) he Twice *Maſhes* it with Freſh Malt, and Twice *Boils* it well: yet all this kept it not from Sowring; as I obſerv'd, during my ſtay there. We bought of it to carry to *Jamaica*, and then he directed us thus; To every Rundlet of 5 *Gallons*, after it is placed in the Ship, not to be ſtirr'd any more, put in Two new-laid *Eggs* Whole, and let them lie in it; he ſaid, that in a Fortnight or little more, the Whole *Egg-ſhells* would be Diſſolv'd, and the *Eggs*, become like *Wind-Eggs*, inclos'd only in a Thin Skin: after this, the Whole *White* would be Prey'd on, but the *Yolk* would not be Touch'd or Corrupted. By this means we did preſerve the *Ale* to *Jamaica*, and it was much better than at *Deal*.

Concerning the *Thames Water*, It is not only Obſervable, that in 8 *Months* Time it acquires a *Spirituous Quality*, ſo as to *Burn*, like *Spirit* of *Wine*; (and ſome *Eaſt-India-Ships*, I am inform'd, have run the hazard of *Firing*, by holding a Candle near the *Bung hole* at the firſt Opening of the Cask;) but alſo that the *Stinking* of it is no *Corruption*, nor perhaps Unwholeſome; for we Drank it all the way ſo as to hold our Noſes, yet had no Sickneſs, but we had a Proportion of *Brandy* each Week, which perhaps might Correct it. If you take off the *Bung* from any *Cask* that *Stinks*, and let the *Air* come to it, it will in 24 *Hours* become *Sweet* again; and if you take a Broom-ſtick and ſtir it about well, it will become *Sweet* in 4 or 5 *Hours*, Caſting a *Black Lee* to the Bottom, which Remixes with it, and ſo occaſions a 3*d*, or 4*th Fermentation*, and *Stench*: after which it *Stinks* no more. But though *Thames Water* upon *Stench* do not *Putrify*, yet *Other Waters* (as far as hath been hitherto obſerv'd) do become Irrecoverable upon *Stinking*, and Dangerous to Drink.

I obſerv'd at *Sea*, after we were out of the *Narrow*, the *Sea* grew *Darkiſh*, and after Perfect *Azure*: yet was it much more *Salt*, the farther we went, as I try'd by a *Water-Poiſe* which roſe about *half* an *Inch*, above the *Sea-Water* in the *Downs*, and at 24 *Degrees* more 2 *Inches*. But after that I never obſerv'd any Difference unto *Jamaica*, the *Sea* being probably ſo Impregnated with *Salt*, as not to imbibe more.

As to the *Colour* of the *Sea*, I conceive there is a great Variety in it and its *Steams*, as in Grounds at Land; which may occaſion the *Sickneſs* in ſome Places more than in others: For the *Sea Smells* Differently in the

Narrow and *Main*. And as to *Colour*, it is of a *Sea-green* (and more *Sickly*) in the *Downs*, than at *Torbay*; and on *Plymouth-Coaſt*, more than paſt the *Lands-End*; and in the *Bay* of *Biſcay*, than in the *Long Reach*. Something perhaps may be Imputed to the Difference of the *Waves*, which are *Short*, and make a *Copling-Sea* in the *Bay* of *Biſcay* (yet we came not within 80 *Leagues* of Cape *Finis-Terræ*:) in the *Long-Reach* it is a *Long Rolling Wave*, but never *Breaks*. About *Florida*, *Virginia*, and *New-England*, it is a great *Rolling Wave*, but *Breaks*. And as the *Sea* Coloureth from *Green* to *Darkiſh*, and ſo to *Blue*: ſo in our Return it Colour'd from *Blue* to *Dark*, and ſo to *Green*. When we were in the Latitude of *Barbadoes*, and had Sail'd ſo for ſome Days, and Apprehended our ſelves to be within 70 or 80 *Leagues*, I obſerv'd the *Sea* was *Black* and Thick, not Tranſparently Blue, as before, and the *Foam* againſt the Ship ſides was Turbid, and of another Conſiſtence, than before: But when the Sun was High it Turn'd Green; whereupon I ask'd the Maſter, who told me, we were within 60 *Leagues* of *Barbadoes*, and that the *Sea* was there *Soundable*, whereas before it was not ſo. But at *Barbadoes*, in the Anchoring Places it was *Blue*; as we Row'd Aſhore, in the Shallow it was *Whitiſh*: And ſo at *Jamaica* near the Shore it is Tranſparently *White*, but within 3 *Yards* more, Tranſparently *Blue*.

As to the *Burning* of the *Sea*, I could never obſerve ſo great a *Light*, as to perceive *Fiſhes* in the *Sea*, off the Stern: yet was the *Light* Great, and at ſometimes more than other. I ſuppoſe ſeveral Subject Earths, Currents and Winds do vary it. I obſerved it *Burn'd* more at *Deal* the Night before we ſet Sail, than ever in the Voyage: All the Water ran off our Oars, almoſt like *Liquid Fire*; the Wind was then S. E. and the Sea-men told me, that at *Eaſt* and *South* Winds it *Burn'd* moſt.

I ſhall not trouble you with an Account, how Two *Contrary Winds* Poiſe each other, and make a *Calm* in the Midſt, Ships at a Diſtance Sailing with Contrary *Gales* at the ſame time.

It is Obſervable, that in the *Indies*, ſuch Places as have any High Mountains, have alſo every *Night* a *Wind*, that blows from the *Land*, Maugre the *Levantine Wind* which Blows at *Sea* (but with a Slacker Gale at *Night*; which ſeems to ſhew it depends not only on the Motion of the Earth, but Sun.) There is none at *Barbadoes* or *Saona*: but at all the other Iſlands; And in *Jamaica* every Night it Blows off the Iſland every Way at Once, ſo that no Ship can any where come in by *Night*, nor go out but early in the Morning, before the *Sea-briſe* come in. I have often thought on it, and could Imagine no other reaſon, but that thoſe *Exhalations*, which the Sun hath raiſed in the *Day*, make haſt (after his ſtrength no longer ſupports them) to thoſe *Mountains* by a Motion of *Similar Attraction*, and there gather in Clouds, and break thence, by their own force and Weight, and occaſion a Wind every way: For as the Sun Declines, the Clouds gather, and *Shape* according to the *Mountains*, ſo that Old Seamen will tell you each *Iſland* in the Afternoon towards Evening, by the *Shape* of the *Cloud* over it. And this *Attraction* appears further, not only from the Rain that gathers on the Tree in the Iſland of *Ferro*, ſpoken of by Sir *R. Hawkins* in his Obſervations, and *If.*

Voſſius

Voſſius upon *Pomponius Mela*, as alſo *Magnenus de Manna*; but alſo from the *Rains* in the *Indies*; there being certain Trees which *Attract* the Rain, ſo as that if you Deſtroy the Woods, you Abate or Deſtroy the Rains. So *Barbadoes* hath not now half the Rains, it had, when more Wooded. In *Jamaica* likewiſe at *Guanaboa* they have Diminſht the Rains as they extend their Plantations, But (to return to *Jamaica*) that this *Night-Wind* Depends much upon the *Mountains*, appears by this, that its force extends to an equal Diſtance from the Mountain, ſo that at *Portmorant*, which is the *Eaſtermoſt* Part of the Iſland, there is little of *Land-briſe*, becauſe the Mountain is Remote from thence, and the *Breeſe* ſpends it's force along the Land thither. I ſhall further Illuſtrate this kind of *Attraction*. In the *Harbour* of *Jamaica* there Grow many Rocks, ſhaped like *Bucks* and *Stags Horns*: there grow alſo ſeveral *Sea Plants*, whoſe *Roots* are *Stony*. Of theſe *Stone Trees* (if I may term them ſo) ſome are Inſipid, but others perfectly *Nitrous*. Upon thoſe other *Plants* with *Petrified Roots*, there gathers a *Lime-Stone*, which Fixes not upon other *Sea-Fans* Growing by them; It is Obſervable alſo, that a *Monchinel-Apple*, falling into the *Sea*, and lying in the Water, will contract a *Lanugo* of *Salt-Petre*. Sect. 12.

It is commonly Affirm'd that the *Seaſons* of the *Year*, betwixt the *Tropicks*, are divided by the *Rains* and *Fair-Weather*, and 6 *Months* are Attributed to each *Seaſon*. But this Obſervation holds not generally True: For at the *Point* in *Jamaica* ſcarce fall (as was hinted above) 40 *Showers* in a *Year*, beginning in *Auguſt* to *October* Incluſively. From the *Point* you may look towards *Port-Morant*, and ſo along to *Ligonee*, 6 *Miles* from the *Point*; and you'l ſcarce ſee, for 8 or 9 *Months*, begining from *April*, an Afternoon in which it *Rains* not. At the *Spaniſh Town* it *Rains* but 3 *Months* in the *Year*, and then not much. And at the ſame time it *Rains* at *Mevis*, it *Rains* not at the *Barbadoes*. And at *Cignateo* (otherwiſe call'd *Eleutheria*) in the *Gulph* of *Bahama*, it *Rains* not ſometimes for 2 or 3 *Years*; ſo that that Iſland hath been Twice *Deſerted* for want of *Rain* to Plant it.

At the *Point* of *Jamaica*, where ever you Dig 5 or 6 *Foot*, *Water* will appear, which *Ebbs* and *Flows* as the *Tide*. It is not *Salt* but *Brackiſh*; Unwholſome for Men, but Wholeſome for Hogs. At the *Caymans* there is no *Water*, but what is *Brackiſh* alſo; yet is that Wholeſome for Men, in ſo much that many are recovered there; by feeding on *Tortoiſes*, and yet Drink no other *Water*. The *Blood* of *Tortoiſes* is *Colder* than any *Water* I ever felt there; yet is the *Beating* of their *Heart* as Vigorous, as that of any Animal (as far as I have obſerved,) and their *Arteries* are as firm as any Creatures I know: Which ſeems to ſhew, I. is not *Heat* that Hardens the *Coats* of the *Arteries*, or gives *Motion* to the *Heart*. Their *Lungs* lie in their *Belly* below the *Diaphragm*, extending to the End of their *Shell*. Their *Spleen* is *Triangular*, and of a *Firm Fleſh* (no *Parenchyma*) and Floridly *Red*. Their *Liver* is of a *Dark-Green*, inclining to *Black* and *Parenchymatous*. In the *Oeſophagus* are a ſort of *Teeth*, with which they *Chew* the Graſs they Eat in the Meadows, which there Grows at the *Bottom* of the *Sea*. All the *Tortoiſes*, from the *Caribbees* to the *Bay* of *Mexico* and *Honduras*, Repair in Summer to the *Cayman*

Iſlands

Islands, to lay their *Eggs*, and to *Hatch* there. They *Coot* for 14 *Days* together, then lay in one Night some 300 *Eggs*, with *White* and *Yolk*. but no *Shells*; then they *Coot* again, and lay in the Sand; and so *Thrice*, Then the *Male* is Reduced to a kind of *Gelly* within, and *Blind*, and is so carried Home by the *Female*. Their *Fat* is *Green*, but not offensive to the *Stomach*, though you Eat it, as Broth, Stew'd. Your *Urine* looks of a *Yellowish-Green*, and *Oily* after Eating it.

There is no manner of *Earth*, but *Sand*, at the *Point*; yet I have eaten admirable *Melons*, *Musk* and *Water Melons*, that have Grown there. A great many *Trees* also grow there, especially *Mangranes* and *Prickle-Pears*.

In some Ground, that is full of *Salt-Peter*, Your *Tobacco*, that grows Wild, *Flasheth* as it is Smoaked.

The *Fruit* of Trees there of the same Kind Ripen not at one Time: There is a Hedge of *Plum-Trees* of 2 *Miles* long, as you go to the *Spanish Town*; on it I have many times remarked some Trees in *Flower*, others with *Ripe*, others with *Green-Fruit*, and others to have done Bearing, at the same time. *Jasmins* I have seen to *Blow* before their Leaves, and also after their Leaves are Faln again.

The *Sower-Sop*, a Pleasant Fruit there, hath a Flower with 3 Leaves; when these Open, they give so great a *Crack*, that I have more than once Run from under the *Tree*, thinking it all to be Tumbling down.

There is a Bird, call'd a *Pelican*, but a kind of *Cormorant*, that is of Taste *Fishy*, but if it lie *Buried* in the Ground but 2 *Hours*, it will loose that *Taste*; as I have been told for certain.

I tried some *Analysis* of Bodies by letting *Ants* Eat them; and I found that they would Eat *Brown Sugar*, *White*, and at last Reduce it to an *Insipid* Powder. So they Reduced a *Pound* of *Salet-Oil* to 2 *Drams* of *Powder*.

At our First Coming there we *Sweat* continually in great Drops for 3 *Quarters* of a *Year*, and then it Ceaseth: During that Space I could not perceive my self or others more *Dry*, more *Costive*, or to make less *Urine*, than in *England*: Neither does all that *Sweat* make us *Faintish*. If one be *Dry*, it is a *Thirst* generally arising from the *Heat* of the *Lungs*, and affecting the *Mouth* which is best Cooled by a little *Brandy*.

Most Creatures *Drink* little or nothing there, as *Hogs*; nay, *Horses* in *Guanaboa* never *Drink*; nor *Cows* in some places of the Island for 6 *Months*; *Goats Drink* but Once perhaps in a Week. *Parrots* never *Drink*, nor *Parrokets*; nor *Civet Cats*, but once a *Month*.

The Hottest time of the *Day* to us, is 8 in the Morning; when there is no *Breeze*. I set a *Weather-Glass* in the Window, to observe the *Weather*, and I found it not Rise considerably at that time: but by two of the Clock it rose 2 *Inches*.

Venice-Treacle did so Dry in a *Gally-pot*, as to be Friable; and then it Produc'd a *Fly*, call'd a *Weavil*, and a sort of *White Worm*. So did the *Pilulæ de Tribus* Produce a *Weavil*.

There

There is in the Midſt of the *Iſland* a Plain called *Magotti Savanna*, in which whenſoever it *Rains*, (and the *Rain* paſſeth along the Iſland before it falls there) the *Rain*, as it ſettles upon the Seams of any Garment, turns in half an *Hour* to *Maggots*; yet is that Plain Healthful to Dwell in.

All the Alteration, our *Sweet-Meats* and *Lozenges*, and *Gammons* of *Bacon* underwent, muſt be attributed to ſome Peculiar Principle in the *Air*: For in all our Voyage to the *Barbadoes* we had not one Shower, that I remember: And if any will have the *Air Moiſt*, whilſt a conſtant *Levant* (that is a *Drying*) Wind fills our Sails, at leaſt during the *Long-reach*, how comes it to paſs, that ſo much *Heat* Joyn'd with *Moiſture* doth not occaſion *Putrid Feavers*? And why in all that Journey, and after in *Jamaica*, when the Glaſſes for many Weeks ſtood Open and Uncovered, did not the *Lixiviate Salts* of *Wormwood* and *Aſh* Contract any *Moiſture*? I am ſure, I never ſet any *Salts* in the *Sun* or near a *Fire*, during my ſtay there, to Preſerve them, or to reſtore them to their *Coagulated* Form. Nor will other *Sea-Salts* there looſe much, if not kept dry by a *Fire*; no, nor Lying on the Ground. For, I have ſeen it kept ſo; yet if it immediately Touch the Ground, ſome of it will *Moiſten* away. But I have ſeen *Tortoiſes* Dry-ſalted, and lie on the Ground Cover'd with *Salt* a *Year*, and the *Salt* under all the Viciſſitudes of Weather never *Give* much, or *Spoil* the *Salted Tortoiſe*.

Additional Obſervations, n. 36. p. 699.

The way of Drinking *Brandy* with *Water* which Sir *Chriſtopher Mings* obſerv'd, was this: *Firſt* to take a Mouthfull of *Brandy*, and whilſt it was yet Hot in your Mouth and Unſwallow'd, to Drink the *Water* and ſo Waſh it down; it being His and a Common Obſervation at *Sea*, that it was ever Wholeſomer to Drink it ſo, than either Mixt with the Water, or After it. For, ſaid he, if you Drink the Water firſt, it gives inſtantly ſuch an Impreſſion of the *Coldneſs* to your *Stomach* and *Lungs*, as that it is too late to Correct it by the ſucceeding *Brandy*. Which Reaſon I could not but Allow of; for in thoſe Parts the Paſſages or Poroſities of the Body are ſo Pervious, that what you Drink, though *Cold*, inſtantly Diſchargeth it ſelf in *Sweat*, or Checks your conſtant and neceſſary *Diaphoreſis*, before you can get the Subſequent *Brandy* down. And Man is ſo Exact a *Machine*, that a much leſs thing Diſorders him There, than Here. And if a little *Brandy* ſhould be Mixt with a Draught of Water, it would not be Efficacious; the *Coldneſs* of the Water being more powerful in Bodies, ſo Tender as we are there, if Hot, to Hurt them, than ſo little *Brandy* to Correct it. But the other way Waſhes the *Brandy* down firſt, and as that goes, it Fortifies Nature every where to receive and Diſtribute the Subſequent *Cold* Liquor.

About the *Colour* of the *Sea*, I have this to Add, That as we went, and paſs'd from a *Green Sea* to an *Azure*, in the way when it was *Dark-Colour'd* the Top of each *Wave*, as it was Caſt up before the Sun, ſhew'd it ſelf to be *Azure*, the reſt of the *Wave* being *Dark-Colour'd*, approaching to *Black*. And the like I obſerv'd coming Home; for, though the *Sea* in its *Dark-Colour* Reſembled exactly what we ſaw before, as we went out; yet did the Tops of the *Waves Break* and appear to be *Green*, long before the great

Waves

Waves or *Body* of the *Sea* became *Green*. I obſerv'd, that the *Sea*, which was *Azure*, and Tranſparent in Sun-ſhiny Days, was *Black* and *Dark-Colour'd*, and much leſs Tranſparent, when the Sun did not Shine. But in the *Green Sea* there happens not the like Difference.

As to thoſe *Plants*, whoſe *Roots* I ſaid were *Stony*, it may be Noted, that ſome of their *Roots* are Totally *Petrify'd*, ſome only in part; the reſt being of another kind of more Vegetable like Conſiſtence; whilſt the *Boughs* and *Trunk* are of another Nature.

Of the *Water* at the *Point* of *Jamaica*, I ſhall further obſerve, That, though the *Sand* does ſo *Percolate*, that you Find it upon Digging 5 or 6 *Foot* deep; yet from that Sand there ariſes no *Steam* into the Air, notwithſtanding the Heat of the Country. For Proof hereof, I obſerv'd, that Men would lie all Night, and ſleep on the *Sands* without Hurt. And to take notice of that particular upon this Occaſion, 'tis an uſual thing for the *Weavill* (or *Fly* that breeds in *Meal*, *Currants*, *Raiſins*, *&c.*) to be thus Cur'd: After that the Sun hath Heated the *Sand*, they ſpread a Sheet, and on that Spread their *Meal*, *Currants*, &c. the Sand being *Hot* under, the ſaid *Weavils* retire from the Bottom to the Upper parts; and theſe being *Heated*, they retire all into the Middle, and thence, being Heated, they are forc'd to run away out, and are ſo Swept away. And if you ſpread the Sheet on the *Firm Ground*, though never ſo much Heated with the Sun, it will preſently grow *Damp* there, and the *Weavils* will Lodge themſelves at the Bottom; ſo as that you can never ſeparate them any where elſe, but on the *Sand*. Alſo in the Nights I obſerv'd, that between the other Ground and our Pendulous *Hamacks*, there gather'd not only a Greater *Coldneſs* of Air, but alſo *Moiſture*, than was obſervable at the *Point*, when we hung in the like Poſture. It is true, that the Reaſon is obvious, why there ſhould be an Air under the Narrow Paſſage betwixt the *Hamack* and the *Ground*, which is not obſervable Above it; but there is alſo a *Dampneſs*, ſo that I was forc'd to put Two Blankets betwixt me and the Bottom, whilſt I had never an one to Cover me a Top

During an Hour or two's Stay at the *Caymans*, I examin'd that Aſſertion of M. *Lygon's*, That a *Tortoiſe* hath 3 *Hearts*; and I found it Falſe: For, although the reſemblance of the *Two Auricles* be ſuch, as alſo their Bodies or Fleſh, as to deceive the Unwary Obſerver, yet is there but *One Heart* Triangular and Fleſhy, the other *Two* are only the *Auricles*, yet of the ſame Shape and Body. The *Two Auricles* Move at a Several Time from the *Heart*, and they are Diſtanced from the *Heart* about an *Inch*; and the paſſage Fleſhy (as I remember) and Narrow by which the *Blood* is Infuſed into the *Heart*. This *Heart* hath but *One Ventricle*; yet are there ſeveral Columns of Fleſh and Receptacles in it, ſuch as are not in the *Auricles*.

The *Graſs* of the *Submarine Meadows* is not a Span long, that I could obſerve, and is of a *Green* approaching to *Yellow*. The *Tortoiſes* Bite much more than they Swallow, ſo that the Sea is Cover'd with the *Graſs*, where they *Feed* at the Bottom. Once in about *half* an *Hour* they come up, and fetch *One Breath* like a Sigh, and then *Sink* down again: And if out

of

of the Water, they *Breath* somewhat Oftner. If you Hurt them on Shore, as they lie on their Backs, the *Tears* will Trickle from their Eyes. You may keep them out of the Water 20 *Days* and more, and yet they will be so Fat as to be fitting Meat, provided you give them Twice a Day about *half* a *Pint* of *Salt-water*. The *Fat* that is about their *Guts* is *Yellow*, though that of the *Body* be *Green*. The *Head* being Cut off, *Dyes* instantly; and if you take out the *Heart*, the *Motion* continues not long. But any Quantity of the *Flesh* will *Move*, if Prick'd, and also of it self, for many *Hours* after it is Cut into Quarters; and the very *Joynts* of the *Bones* of the *Shoulders* and *Leggs* (answering our *Omo-plate* and *Thigh*, yet within the *Shell*) have their *Motion*, and even though you Prick only the *Fat* of it. But if you place these Parts of the *Tortoise* in the Sun, they Presently *Dye*. The *Leggs Dye* as soon, in a manner, as Cut off.

The *Eggs* of *Crocodiles* and *Alligators* are little bigger than a *Turkey's*; The *Shell* is as Firm, and like in Shape, to a *Turkey's*, but not *Spotted*. I enquir'd into the *Stone* in the *Stomach* of a *Cayman* or *Crocodile*, and I found by the Enquiry of a very observing Gentleman there, that they were nothing but several Stones, which that Creature Swallows for *Digestion*. He took out of one a piece of a Rock as Big as his Head: out of others he had taken 16 or 20 Lesser. None regards them much there, whatever *Monardes* relateth.

I could not hear of any *Stones* found in the *Gall* of the *Hogs* there; but 'tis Usual to find little Stones in their *Bladder* of several Sizes, but the Shapes of them (none weighing a *Scruple*) were *Angular*, and Pointed with 5 *Angles*.

De Laet is in the right as to his Description of the *Manati-Stone*. But he is out in his *Lapis Tiburonum*: For though a *Tiburon* or *Shark* be all one, and Differ from a *Manati*, or *Sea-Cow*: yet, by his leave, though that same be a kind of *Friable Calx*, when it is brought Hither, yet when it is *First* taken out, it is not so, but a *White Substance*, near approaching to the Nature of any *Brain*, and encompass'd in a Transparent *Gelly*. The *Gelly* Dries all away, as it is expos'd to the Sun: and the *White Substance* Dries into the Body, he speaks of. If my Memory fail me not extremely, it is taken out of Two places over each Eye; and both being usually by Seamen put into the same Paper together, to Dry, pass for One. That Creature hath no *Bone* in his Back, as vast as his Strength is; only in his *Head* there are *Bones*. His *Jaws* are *Gristles*; and he hath Rows of *Teeth*, which are *Bones* like *Lancets*, and Moveable in him, to Erect, or lay Flat; and Multiply to 3, or 4, or 5 (perhaps more) as he Grows in Years. His *Back-bone* is all *Gristly* (and so are his *Ribbs*) yet Divided into *Vertebræ*. The Seamen usually Cut them into *Walking-Staves*. They and the *Dolphin* Swim Faster than any Ship Saileth: So do the *Spanish-Maccarel* also.

Civet-Cats, if you do not give them *Drink* at all, they will not Dye in a longer time than a *Month*. But if they *Drink* once a *Month*, they will yield more *Civet*, as I was told; and so if they be Fed with *Fish*. Yet

they *Piss* much, as do *Rabbets*. In those Places where there is no *Rain* for a whole Month, or longer, nor any River or Pond, *Cows* lick the *Dew*, for a supply. A Butcher kill'd a Bull in an Island, where he could have no Water but what was Salt: he assur'd me, that his *Bladder* was *Dry'd* up, so that he made very little or no *Water*; yet he must be guess'd to have liv'd in that Island before the *English* came thither; which was 6 *Years* before he was kill'd.

The *Swallows* in *Jamaica*, as Hot as 'tis, *Depart* in the *Winter-Months*, and the *Wild Ducks* and *Teal* come hither then.

The so Fam'd Tree, call'd a *Cabbage-Tree*, I assure you, is nothing else than a *Palm-Tree*: and all that is Eaten as the *Cabbage*, is, what Sprouted out that Year, and so is Tender. If Eaten Raw, it is as good as any *New-Almonds*; and if Boil'd, excells the Best *Cabbage*. When that Top is cut off, the Tree Dies. There was one of those Trees at *Barbadoes*, above 300 *Foot* High, as I was told for certain. This Tree will never *Rot*, and when 'tis Dry'd, grows so Hard, that you cannot drive a Nail into it.

'Tis a Mistake (above) that any *Tobacco* grows *Wild*, in *Jamaica* at least. The *Nitrous Tobacco*, which grows upon *Salt-Petre* Ground, will not come to so Good a Colour, nor Keep so long, as other *Tobacco*; insomuch that the Merchants oftentimes loose all their *Tobacco* in the Voyage for *England*, or *Ireland*, it *Rotting* all by the way. In the same *Salt-Petre* Ground the *Potato's*, that are Planted there, are Ripe 2 Months sooner than elsewhere; but if they be not Spent Presently, they *Rot*, the *Salt-Petre* (as they told me) Fretting the Outward Skin of the *Root*, which is thinner in that sort of Ground than in other Places. The *Sugar-Canes* also in those Places grow Larger and Faster, than in other Grounds, but *Rot* presently, if not Ground; and do not Boil so well to *Sugar*.

In *Jamaica* the *Sugar* Cures faster in 10 *Days*, than in 6 *Months* at *Barbadoes*: And this happens on those Places, where it *Rains* for many Months together; but you must know, that *Rains* there are Sudden, and make no Previous Alteration in the *Air* before they Fall, nor do they leave it *Moist* afterwards.

There is a Tree call'd a *Bastard Cedar*, whose *Wood* is really so *Porous* (though you would not guess so upon View) that being Turn'd into Cups, Wine and Brandy will Soak through at the Bottom in a short time.

There are many kinds of Wood in the *Indies*, besides that of the *Acajou* or *Cajous*, that Breed no *Worms*: and there is a Tree call'd *White-Wood*, in *Jamaica*, of which if you Build *Ships*, they will never Breed any *Worm*.

The *Soap Tree*, I have seen growing at the *Spanish Town*: and the *Berries* of it (being as big as Bullets of Musquets) without any proportion of *Salt-Lixiviate*, or *Sulphur*, or *Oyle*, Wash better than any *Castle-Soap*; but they *Rot* the Linnen in time.

They have in *Jamaica*, 3 *Barks* to *Tann* with, the *Mangrave*, *Olive-Bark*, and another. They *Tann* better than in *England*, and in 6 *Weeks* the *Leather* is ready to work into Shoes.

The

The *Juice* of *Manioc*, or *Caſſavi*, is rank *Poiſon*. All *Hogs* and *Poultry* that Drink it, Swell and Die preſently. If the *Root* be Roaſted, it is no *Poiſon*, but only occaſioneth *Torſions* in the *Belly*.

Concerning the *Oyl* of *Palma Chriſti*, the *Indians* uſe it for *Lamps*. It is a Delicate, Sweet and Tranſparent *Oyl*: But I could never find it operate in *Phyſick*, notwithſtanding I have given a Spoonful of it, and 3 in a *Clyſter*. This *Palma* does Yield an exceeding great quantity of *Oyl*, and, did we mind any thing, might be a *Staple-commodity*. The *Leaves* applied to the Head, give great Eaſe to the *Head-ach*, as I have tried in my ſelf; and it is the only *Remedy* of the *Indians* and *Negro's*.

The *Manchinel-Tree*, is a Wood of an excellent *Grain*, equaling the *Jamaica Wood*, but large to 4 *Foot* Diameter. The *Spaniards* turn it into Beds, and the *Engliſh* uſually Floor their Rooms with it in *Jamaica*.

The *Birds*, call'd by ſome *Fregati*, we call *Men of War*; their *Fat* is good againſt *Aches*, *&c.* So is that of *Allegators*, or the *Shell-Fiſh*, called *Soldats*, or *Souldiers*.

Of the *Shining* or *Fire-Flies* there is a great Difference in *Hiſpaniola* and *Jamaica*, as to Bigneſs. They can Contract and Expand their *Light* as they Fly, I am ſure; and their *Light* continues ſome Days after they are Dead: So that I am not of their Mind, who Affirm, that 'tis the *Flammula Cordis* in their *Tail*.

The *Wood-Lice* will Eat Covers and Books, though Printed as I found to my Coſt: and they will Eat ſome ſorts of *Timber*, but not all.

When the *Cirons* or *Chegoes* come among the *Nervous* and *Membranous* Parts, they are very Painful, and not to be Pulled out, leſt your Needles touch the *Nerves*.

I could never Hear of any *Hurrican* about *Jamaica*. I enquired of ſome, that had been in *Hurricans*, and they told me, that they had found it to be much *Colder* then than at other times. I enquired of the Nature of theſe *Tempeſts*, whether the *Wind* varied all the Points of the Compaſs, as 'tis ſaid; They anſwer'd, No; but it began always with a *North-Wind*, and when it came *Eaſt* it ceaſed: But betwixt the *North* and *Eaſt* Point it varied ſo faſt, and with ſuch a Violent Guſt always, that it was impoſſible for any Ship in the Water to Anſwer the *Vering* of the *Wind*: Whence it happened, that the Backs of the Ships are Broken, and the Sails and Maſts carried by the Board. I ſaw a Veſſel of about 400 *Tun*, whoſe *Main-Maſt* (which is no ſmall one in ſuch a Ship) was Wreathed as you would Wreath a *With*, in an inſtant, and ſo born by the Board, before ever they could Hand a *Sail*.

As we Sail'd for *England* and were to Double the *Cape* at the End of *Cuba* in order to our Paſſing the *Gulph*; betwixt the 2 Capes of *Cartooche* towards the *Main*, and Cape *Antonio* in *Cuba*, there is a *Current* which ſometimes Sets Weſterly, ſometimes Eaſterly. If it Set Eaſterly the Ships have a ſpeedy Paſſage in 3 or 4 *Days* to the *Havana*; otherwiſe 'tis a Fortnight or 3 *Weeks* Sail, the Ship being Imbayed in the *Gulf* of *Mexico*. To know which way the *Current* Sets, in Calm Weather, no Wind at all ſtirring, thus they Try it. They Hoiſt out their Boat, and having rowed a little from the Ship,

they let looſe their Plummet (ours did Weigh 40 *Pounds*) and Sink it 200 *Fathom*. Then though it never touches the Bottom, yet will the Boat turn Head againſt the *Current* (which conſtantly runs very ſtrongly of its ſelf, ſince ſo much of *Sea* runs into the *Gulf* of *Mexico*) and rides as Firmly, as if it were faſtened by the ſtrongeſt Cable and Anchor to the Bottom. If you wonder to hear me mention a *Calm* there abouts, where you would expect a Conſtant *Levantine* Wind; I ſhall inform you, that 'tis no Unuſual thing to meet with *Calms*, if you approach within any Diſtance of Land: for ſome Guſt, or *Land-wind* will ſo *Poyſe* the *Levantine-wind*, that you ſhall have a Perfect *Calm*.

The Change of *Climate*, and the Effects of it are very Senſible to our Bodies, as we approach the *Tropick*. There uſually happened *Sickneſſes* in our Ships about that Time; and as ſoon as the Seamen paſs the *Tropick*, they ſtill uſe Expreſſions of Joy, by Firing of Guns in Teſtimony of Gladneſs for their Safe Arrival ſo far. I could not learn of the Old Seamen any other Reaſon for the Different Condition of Health, with which our Ships now Sail, in Compariſon of what our Anceſtors Experimented, than this: Generally all our Seamen and Paſſengers *Let Blood* in the Voyage before that time. Yet is not that to be done Raſhly, nor by all in the ſame *Degree* of *Latitude*; for I carefully obſerved in our Ships the Alteration of our Bodies upon the Change of *Climate*, and found that the *Blood* of the *Engliſh*, which conſiſts of parts more Groſs, and is Extracted from a more Subſtantial Food, *viz.* that of *Fleſh*, than in other Countries, did Attenuate, and the *Pulſes* in ſome became very Lofty, Full and Quick; in others, Slow, yet more lofty and full than before. In ſome there was a Senſe of *Pricking* in their *Fleſh*; in ſome a great *Dulneſs*, and *Oppreſſion* of *Spirits* and *Heavineſs*: after which they paſs into a Condition of *Sweating*, which purſues them afterwards for a long time. From this Agitation of Humours, it is eaſy to ſhew the Reaſon, why our Anceſtors fell Sick, and how neceſſary it is to *Bleed*, when any feel thoſe *Symptoms* in him: for immediately upon *Bleeding* the *Pores* are opened, and they fall to *Sweat*; and by this Courſe, thoſe numbers of People we carried over with us to *Jamaica*, Arrived Safe. Some I cauſed to be *Blooded* in 32 *Degrees*, ſome in 28, ſome in 24, and 23 *Deg.* And in all our Ships there died but Three. In our Ship, Two had the Diſeaſe, ſo much talked of, call'd the *Calenture*: but they were thus *Cured* preſently. I was talking with one of them, and on a ſudden he beheld Green-leaves, as he Imagined, Floating on the Sea, which yet was *Azure Coloured*: after that he began to admire the fine Woods, which he fancied to be near us. I immediately gave him a *Vomit* of the *Glaſs* of *Antimony* in *Sack*; which no ſooner had wrought its Effect, but all thoſe Imaginations Vaniſhed. At Night I gave him ſome *Conſerve* of *Red Roſes Vitriolated*, *Salt* of *Wormwood* and *Diaſcordium*: the next Day he was *Blooded* at the *Arm* in the Morning; and in the *Fore-head* in the Afternoon, His *Diet* was *Water-gruel* with *Cream* of *Tartar* in it; and alſo ſome *Prunes Stewed*. I could perceive nothing of any *Feaver* in the Diſeaſe; his *Pulſe* was Low, Slow and Equal; his Temper rather *Colder* than ought to be; ſo far was he from any Senſe of *Heat*, or *Diſcoloration* of his *Tongue*, or

Thirſt.

Thirſt. The other Perſon Imagined nothing but *Groves* of *Oranges* and *Limons*, and begg'd the opportunity of a Boat, to go aſhore, with great earneſtneſs; ſo that if not Watched, perhaps he might have Leap'd into the Sea. The *Symptoms* were the ſame as in the other; only his whole Body ſeem'd to be much *Colder*; yet was not he ſenſible of any *Coldneſs* in himſelf. I cauſed him to be *Vomited*; and he was well in his *Head*, as ſoon as ever the *Vomit* made him *Sick* at the *Stomach*, as yet not having Wrought. I *Dieted* him as the other, and only *Blooded* him in the *Arm*. I let them *Blood* meerly out of Caution (for elſe they ſeem'd Well) and to Promote *Tranſpiration* and *Sweating*, which ſucceeded according to my deſire.

Undoubtedly the Seat of that *Diſeaſe* is in the *Stomach* and thoſe Parts adjoyning to it, in which the *Firſt Concoction* is perform'd, and 'tis highly probable, that it principally ariſeth from the *Ill-Diet*, by Eating too much *Salt-Meat* in Voyages; the *Saline Steams* from the *Stomach* affecting the *Brain* in a peculiar manner.

As to the *Cure* by *Vomiting*, I ſhall not now explain, How *Vomits* Work; it ſufficeth, that the Diſeaſe was Seated in and about the *Ventricle*; and that in *Hot Countries*, as well as in *Hot Seaſons*, the *Rule* of *Hippoc.* takes place, *Æſtate per Superiora*. I never ſaw any good Effect of the moſt Innocent *Purge*, during my ſtay in the *Indies*, except in *Chronical* Diſtempers; nor did I ever almoſt Give any (after Frequent Trials had made me Cautious) but *Pills* that were *Antimonial*, or *Mercurius Vitæ*, or *Vomitive Infuſions*. And by this Method I preſerved our Ships Well, and Effected thoſe ſpeedy *Cures*, which I think, none had before ſeen in *Jamaica*. It is true, of the common ſort in the other Ships, when we came to *Barbado's*, upon view I found many *Hydropical* and *Scorbutical*: And as ſoon as we came there, I cauſed all, that were any thing Ill, to be *Vomited* and *Purged* with *Mercurius Vitæ*, the *Vomitive Infuſion*, and *Cambodia*; by which means and one Meal of *Freſh* Meat, and ſome *Limons*, all the Diſorderly Rabble Recover'd.

The *Sea-Brieze* comes not into *Jamaica* till 8 or 9 of the *Clock* in the Morning, and ordinarily ceaſeth about 4 or 5 at Night: But ſometimes the *Sea-Brieze* blows in the *Winter Months* 14 Days and Nights together; and then no *Clouds* gather, but *Dews* fall. But if a *North Wind* Blow (which ſometimes in the Winter Months laſts as long) then no *Dews* Fall nor *Clouds* Gather. The Clouds begin to Gather about 2 or 3 of the *Clock* in Afternoon at the *Mountains*, and do not Embody firſt in the Air, and after Settle there, but Settle firſt, and Embody there; the reſt of the *Skie* being Clear till Sun-ſet. So that they do not paſs near the Earth in a Body, and only ſtop where they meet with Parts of the Earth Elevated above the reſt: but *Precipitate* from a very great Height, and in Particles of an exceeding Rarified Nature, ſo as not to Obſcure the *Air* or *Skie* at all; that great Variety of Beautiful Colours in the Canopy of Heaven, being raiſed to a much greater Diſtance than 'tis Here.

The Obſervations continued. n. 37, p. 717.

The *Tortoiſes* Float *Aſleep* in a Calm day a long time: ſo that the Seamen row gently to them, and either ſtrike them with Irons, or enſnare their Legs with a Rope and runing Net, and ſo take them.

I could never adjuſt the *Doſe*, of the *Purging Nuts*, having given from 3 to 60. without any Effect in the ſame Perſon, ſo that I never durſt rely on them; yet they often do Work, as is related.

Inquiring at the *Barbadoes* of the Doctors and Chirurgions there, about the Uſe of *Opium*, ſo much magnified by *Bontius* and *Piſo*, I heard them all Condemn it, as moſt *Stupifying* and *Mortal*; and I found that they uſed the *London-Laudanum*, which I have obſerv'd to be very *Narcotique*, the *Opium* being Extracted with *Spirit* of *Wine*. But I had a *Laudanum*, of M. *Le Fevre*, call'd *Laudanum Simplex*, of Torrefied *Opium*, Extracted with *Diſtill'd Vinegar* and ſome other *Correctives*, which never *Stupifies*, no, nor Inclines to *Sleep* after 'tis taken, yet immediately *Eaſeth* all *Pain*. I took it my ſelf for 14 *Days* every Night in the *Bilious Colick*, which immediately Eaſed the *Pains*, but perhaps I *Slept* not till 2 or 3 *Hours* after; taking it with ſo much ſecurity, that I very ſeldom Weighed it, but Gueſs'd at a Pill of 2 or 3, or even 4 *Grains*. Nor hath this *Laudanum Simplex* (by his Obſervation) only this Effect in the *Indies*, where I uſed it in all Caſes to all Ages, even *Sucking Children*, but even here in *England* I gave it, not long ago, to a Lady in the *Colique Bilious*, never weighing it, and it Eaſed her *Pains*, yet did ſhe never Apprehend, that ſhe had taken any ſuch thing, and all the Night if any did but ſtirr, ſhe could hear them as perfectly, as ever ſhe could when ſhe *Slept* Naturally.

The Obſervation which *Oviedo* hath about *Lice*, which is, that they Leave the *Spaniards* as they Go to the *Indies* in ſuch a *Degree*, and Meet them again in the ſame *Latitude* in their Return, is very True. For though the Ships we went in, with ſuch a Multitude of Servants and Seamen, were not Over Cleanly, yet before we came to the *Tropick*, there were none *Lowſy*; whereas before one could not walk amongſt them, but his Cloths would gather *Lice*. In the *Indies* none are *Lowſy*, how Naſty ſoever, except it be in their *Heads*; and there they Breed much. But in our Return home I obſerv'd that they did Multiply again, after we came to the *Latitude* of the *Maderas*. Sir *Chriſtopher Mings* was of this Opinion, that when they approach the *Long-Reach* and *Tropick*, they begin to *Sweat* exceſſively, which *Sweat* abounding over the Body, Choaks the Old *Lice* and Kills them: Juſt thus, *he ſaid*, it was an uſual Remedy for *Lowſy*-Heads to Rub them all over with Butter or Oyl, and he would Warrant it would Kill all the *Lice*. And as for any New Generation, the *Sweat* not lodging in the Pores long enough, it was not diſpos'd to produce thoſe Vermine at all; for no *Sweat* in the *Indies* is Rank, as in *Europe*, that ever he could obſerve. In their Return the *Sweat* lodgeth longer in the Pores and Habit of the Body, and the Particular *Forms* or *Ferments*, being Exalted and Unlooſen'd, and put into Activity, Shape out thoſe Creatures, and ſo they Breed them. But, if you ask, Why they *Breed* in the *Head* in the *Indies*; He anſwers, That though our Faces *Sweat* much, yet doth not our *Hair* ſo much: beſides that, the *Sweat* is lodg'd in the *Hair*, and there Breeds the *Vermine*, and they take not the Care of their *Heads* there as here. However, the *Spaniſh Ne-*

groes

groes Waſh their *Heads* with *Soap* once a *Week* to prevent being *Lowſy*, whilſt the other *Negroes* looſe a great deal of Time in looking after their Heads; which by reaſon of their Curls Breed *Lice* more than the *Engliſh*, inſomuch, that he affirms to have ſeen great Holes eaten by *Lice* in the Heads of ſome of them that were Lazy.

In the *Colick Bilious* we often uſed *Clyſters* of *Tobacco-Smoak*, but with no Succeſs at all. I alſo gave the *Juice* of *Tobacco*, an *Ounce* in a *Clyſter*, which *Stupify'd* extremely, but did no other good, than for the preſent to render them Inſenſible of their *Pain*. It is uſual to give *Clyſters* of a *Pint* of *Brandy* there, which will make them as Drunk and Mad as if they had taken it at their Mouths: I obſerv'd that leſs *Brandy* would *Foxe* them In a *Clyſter* than if Drunk by them. I try'd a *quarter* of a *Pint* in a *Clyſter* on my ſelf, and it made me, not Dead *Drunk* but Raging *Mad*, (though mixt with other things) my Reaſon being Deprav'd by theſe *Fumes*: So I never took more of that *Clyſter* but once to Reiterate the Experiment, the Effect being the ſame. But I comply'd with the *Spaniſh Negroes*, who to *Nouriſh* me, gave me a *Clyſter* of *half* a *Pint* of *Madera-Sack*, the *Yolk* of one *Egg*, and a little *Pepper*, Warm'd and Given at Night, and to Hold it in all Night: which did Gently Warm my Bowels, and Caſt me always into a gentle *Sleep* and *Sweat* for ſome Hours: I took many of theſe in the Day time, the Effect ceaſing after 2 or 3 *Hours*.

I am of Opinion, that *Chocolate*, if it were well made and taken in a right way, is the beſt Diet for *Hypochondriacks* and *Chronical Diſtempers*, and the *Sourvy*, *Gout*, and *Stone*, and *Women Lying-in*, and *Children New born* (to prevent *Convulſions* and Purge the *Meconium* out) and many other Diſtempers, that ever came into *Europe*: but 'tis now rather Us'd for *Luxury* than *Phyſick*, and ſo Compounded as to Deſtroy the *Stomach*, and to Encreaſe *Hypochondriacal Diſeaſes*.

The *Chego's* breed commonly in the *Negro's*, yet no *Engliſh* get them, but by going in places frequented by them. They are Incident moſt to ſuch, as are Naſty about the Feet; and very ſeldom any elſe have them. They will Spread by little and little over the whole Feet, Eat off Toes, and Over-run the whole Body of ſome Idle *Negroes*. N. 41. p. 825.

2. *Alligators* are ſhap'd like *Lizards*, being *Four-footed* they Walk with their Belly at a Diſtance from the Ground, like *Lizards*. Thoſe of a full Growth, have *Teeth* like a *Maſtiff*, and a *Mouth* of $1\frac{1}{2}$ *Foot* Wide. They are of ſo Strong a *Scent*, that you may *Smell* them at a pretty Diſtance, when they lie on the Land. They may be Maſter'd and Kill'd by any, Dexterous and Skil'd in the way of doing it, which is, that a Man be Arm'd with a good long Truncheon, and fall upon them *Side-ways*; for doing it *Front-ways* they are too nimble for the Aſſailant, and may, by Leaping upon him, (which they can do the Length of their whole Body) Spoil him: but if he lay his Club on them againſt their Shoulder, and behind their Fore feet, and Lame them there, they are eaſily Subdu'd. *Some of theſe Obſervations farther conſider'd; by Mr. Norwood. Jun.* n. 41. p. 824.

Tortoiſes, if their *Blood* be *Heated*, Dye: and if they ſhall Live, their *Blood* muſt not be *Hotter* than the Element they Live in.

The

The *Chego's* are not Felt to have got into the Body, till a Week after. They will breed in great Numbers, and ſhut themſelves up in a Bag: which when you feel, there are certain Skilful Men, who with Little *Pain* will take them out; having great Care to take out the *Bag* Entirely, that none of the Brood (which are like *Nits*) may be Left behind, for fear of giving riſe to a New Generation.

The *Shining Flyes* are a kind of *Cantharides*, looking Green in the Day-time, but Glowing and *Shining* in the Night, even when they are *Dead*. I have apply'd them *Dead* to a Printed and Written Paper in the Dark, and *Read* it.

The *Manchinel-Apple* is one of the Beautifuleſt Fruits to the *Eye*, of the Agreeableſt to the *Smell*, and of the Pleaſanteſt to the *Taſte* (being thence call'd by many the *Eve-Apple*): but if Eaten Certain *Death*. The *Wood* of it yet *Green*, if Rubb'd againſt the Hand, will fetch off the *Skin*, or Raiſe *Bliſters*; and if any Drops of Rain, falling from this Tree, light upon one's Hand, or other Naked Part of the Body, it will alſo have the aforeſaid Effect.

Obſervations made at the Barbadoes; *by Dr.* Tho. Towns. n. 117. p. 399.

XI. At the *Barbadoes*, our general Draught of *Wine* is from the *Madera*, which, contrary to all other I know of, will not endure a *Cool Cellar*. *French* nor *Rheniſh Wines* neither Keep nor Agree well with our *Stomachs*, if ſo conſtantly Drunk as in *England*. *Canary-Wine* few here Care for, counting it Fulſome.

This Iſland is very *Temperate*: and the Sun, notwithſtanding his Neighbourhood, is very Gentle, being fann'd with a Conſtant Gale from the *Eaſt*.

I obſerve that *Purſlane* is here all the Country over, where I have been, and even troubleſome to the Planter: In the Fields I have many times gathered a *Sallat* of it, and it Eats as well with Oyl and Vinegar as that of our *Engliſh* Gardens. Here is likewiſe a *Sonchus*, *Lens Paluſtris*: I found alſo a *Melilot*, or one ſo like it in all Circumſtances (except that the Branches are not ſo Erect) that I cannot find any difference from that of *England*.

The *Springs* here are all near the *Sea*: ſo that thoſe who Live up in the Country have no benefit of them. They made Ponds formerly to receive Rain; which ſerved well enough, being kept Cool by a broad Leaved *Weed* and *Ducks Meat*, which overgrew moſt *Ponds*: But now almoſt every *Sugar Plantation* hath a *Well*, that gives very good *Water*.

The *Soil* is Fertile, though not above a *Foot* or *two* Thick upon a White and Spongy *Lime-Stone-Rock*; which affords good *Quarries* here and there, that ſerve for Building. Every *Dwelling Houſe*, with the *Sugar-Work* and other Out-houſing, looks like a Handſome Town; moſt being new Built with *Stone*, and cover'd with *Pantile* or *Slate*, brought hither in the *Ballaſt* of Ships, as are likewiſe *Sea-Coal* for *Forges*, and ſo are bought Cheap enough. Indeed the whole Iſland appears in a manner like a Scattered Town, which with

with the Perpetual Green Fields and Woods makes the Place very Pleasant.

The *Blood* of *Negro's* is almost as *Black* as their *Skin*. I have seen drawn forth the *Blood* of at least 20, both Sick and in Health, and the Superficies of it all is as *Dark* as the Bottom of any *European Blood*, after standing a while in a Dish. So that the *Blackness* of *Negro's* is likely to be *Inherent* in them, and not Caused by the *Scorching* of the *Sun*, especially seeing that other Creatures here, that Live in the same *Clime* and *Heat* with them, have as *Florid Blood* as those that are in a *Cold Latitude*, viz. *England*.

XII. I never saw any *Sand* in the *Bermudas*, such as will Grind Glass, or Whet Knives, *&c.* as in *England*; but a Substance like *Sand* though much Softer: Neither have we any *Pebble-Stones*, or Flints.

An Observation in Bermudas; *by Mr.* Rich. Norwood. *n.* 30. *p.* 566.

XIII. There is an Island among the *Bahama's*, which is call'd *New Providence*; where many Rare things might be Discover'd, if the People were but Encourag'd. 'Tis Stor'd with variety of *Fish* and *Fowl*, and with divers sorts of *Trees*, and other *Plants* whose Qualities are not yet known.

Observations in New Providence, Bermudas *and* Virginia; *by Mr.* Rich. Stafford. *n.* 40. *p.* 794.

The Inhabitants here at *Bermudas* Live some to an *Hundred* Years and something upwards; Many do Live till they are Nigh a *Hundred*, but few above. And when they *Dye*, 'tis *Age* and Weakness that is the Cause, and not any *Disease* attends them. The General Distemper that is Yearly amongst us, is a *Cold*; and that is most gotten in the *Hottest* Weather. The *Air* is here very Sweet and Pleasant. Our *Dyet* is but ordinary, and the People Generally Poor; and I observe that Poor People are most *Healthful*.

That *Weed* which we call *Poyson Weed*, grows like our *Ivy*. I have seen a Man who was so *Poyson'd* with it, that the Skin Peel'd off his Face, and yet the Man never Touch'd it, only look'd on it as he passed by: but I have Chaw'd it in my Mouth, and it did me no Harm. It is not Hurtful to All.

Here are *Spiders*, that Spin their *Webs* betwixt Trees standing 7 or 8 *Fathoms* asunder: and they do their Work by *Spirting* their *Web* into the *Air*, where the Wind carries it from Tree to Tree. This *Web*, when finish'd, will Snare a *Bird* as Big as a *Thrush*.

We cover our Houses with the *Leaves* not the *Bark* of a *Tree*, which is the *Palmetto*; without which *Tree* we could not Live comfortably in this Place. The Leaves of some of these Trees are 8 or 10 *Foot* Long, and nigh as Broad.

'Tis reported, That in *Virginia* and upon the Coast of *Florida*, the *Indians* Live to a very Great *Age*; and that some of the People are of a *Gigantick Stature*, and Stronger by far than others.

XIV. *Sept.* 2. 1699. we Weigh'd at *Madera*, and were under the *Tropick* of *Cancer* by the 10*th* of the Month, at which time the usual Ceremony of *Ducking* from the *Yard's Arm* was perform'd on those that could not pay their *Tropick Bottle*. All this time we had a brisk and Constant *Trade*

A Voyage to New Caledonia *in* Darien; *by Dr.* Wallace. *n.* 262. *p.* 558.

Wind, which lasted 3 *Days* more, but afterwards we had it more *Variable* than is usual in that place of the Sea.

The 28, we made *Deseada*, a small High Island, about a *League* in Length and as much in Breadth; it is full of Trees, but Uninhabited. Next Morning we were betwixt *Antego* and *Montserat*, belonging to the *English*. Their Product is Sugar and Tobacco. We were in the Afternoon close by *Redonda*, a small Rock about a *Mile* long, Inhabited only by *Noddies* and *Boobies*. When we were some *Leagues* from *Redonda*, we saw at the same time *Antego*, *Montserat*, *Redonda*, *Nieves*, *St. Christophers*, and *Statia*.

The next Day (which was the 30*th*,) we came in sight of *Santa Cruz*, belonging to the *Spaniards*.

Oct. 2. We came into *Crab-Island*, and sent some of our People a-shore, and took *Possession* of it in the *Company's* Name.

Oct. 4. We stood to the *Leeward*, hearing there was a Harbour there; and when we came we saw the *Danes* Colours flying on the Shore, for the Governour of *St. Thomas* (a small Island belonging to the *Danes*, and a *Free-Port*) had sent 14 Men and a Captain to take Possession of it in the King of *Denmark's* Name: but we found that we had taken Possession of the Place before they came from *St. Thomas*. They gave in their Protest, yet seem'd to be glad enough of our Neighbourhood.

On the 8*th* we left this place, and on the 17*th* made *Nostra Signora della Popa*, we lay aside there along the Coast, until the 3*d* Day of *November*, generally Losing by Night what we had Gain'd all Day. *Crab-Island* is about 6 *Leagues* long, and in some places 5 broad; the *Soil* is very good. It is all full of *Trees*; all the South-side is full of Bays very fit for Anchoring in, but the best of all is to the *Leeward*, where the *Dane* Hoised his Colours. It is call'd *Crab-Island*, from the Multitude of *Land Crabs* there.

Nov. 3. We Anchor'd before *Golden Island*, and sent in our Pinnace to the Bay. The Natives had Hoised a White Flag in Sign of Peace, and told us a great many Stories of Capt. *Swan*, Capt. *Davies*, and others, for they took us for *English*, by reason of our Red *Fly*; but we took no Notice of the Men they Nam'd. At last they ask'd us our Business, we told them we design'd to Settle amongst them, and to be their Friends. They told us, we were very Welcome, and that by *Prediction* they had expected us these 2 *Years*; for they say that 2 *Years* ago it was foretold them, That a People should come and Live amongst them, that would Treat them Civilly, and Teach them Good Manners. We Convers'd sometime with them, and after Viewing the *Harbour* we came a-board.

The 4*th*, we came into the *Harbour* of *Caledonia*: It is a most excellent one, for it is about a *League* in length from N. W. to S. E. It is about *half* a *Mile* broad at the Mouth, and in some Places a *Mile* and more farther in. It is Large enough to contain 500 *Sail* of Ships. The greatest part of it is *Land-lock'd*, so that it is Safe, and cannot be toucht by any Wind, that can Blow; the *Harbour* and the *Sea* make the Land that lies betwixt them a *Peninsula*. There is a Point of the *Peninsula* at the Mouth of the

Harbour,

Harbour, that may be Fortify'd againſt a Navy. This Point ſecures the *Harbour*, So that no Ship can Enter but muſt be within reach of their Guns. It likewiſe defends *half* of the *Peninſula*; for no Guns from the other ſide of the Harbour can Touch it, and no Ship carrying Guns dares enter for the *Breaſt-work* at the Point. The other ſide of the *Peninſula* is either a Precipice, or Defended againſt Ships by *Shoals* and *Breaches*, ſo that there remains only the Narrow Neck that is not Naturally *Fortify'd*. In ſhort, it may be made Impregnable, and there is Ground enough within it, if it were all Cultivated, to afford 10000 Hogſheads of *Sugar* every Year. The *Soil* is Rich; the *Air* Good and Temperate, the *Water* is ſweet; and every thing contributes to make it Healthfull and Convenient. The *Product* of this Place, I mean in the *Harbour* and *Creeks* hereabouts, is *Turtle*, *Manatee*, and a vaſt variety of very good ſmall *Fiſh*, from the bigneſs of a *Salmon* to that of a *Perch*. The *Land* affords *Monkies* of different ſorts, Wild *Deer*, *Indian-Rabbet*, *Wild Hog*, *Parrots*, of many kinds, *Parakites*, *Macaws*, *Pelicanes*, and a hundred more *Birds* we have got no Name to. There are moreover *Land-Crabs*, *Souldiers*, *Land-Turtle*, *Lizards*, *Guanba's*, *Cock-Lizards* and *Scorpions*: I had almoſt forgot *Partridges*, *Pheaſants*, and a kind of *Turkey*. All the *Birds* in this Country are Beautiful, but none of them that I could obſerve have any *Notes*. We have a *Monkey* aboard that Chirms like a *Lark*, it will never be bigger than a *Rat*. This Place affords Legions of *Monſtrous Plants*, enough to confound all the methods of *Botany* ever hitherto thought upon. Some of their *Leaves* exceed 3 *Ells* in Length, and are very Broad. Beſides theſe *Monſters*, reduceable to no *Tribe*, there are here a great many of the *European* Kindred, (but ſtill ſomething Odd about them) as *Lingua Cervina* of Different kinds, *Polypodium*, ſeveral of the *Plantæ Papilionaceæ*, *Muſci*, *Fungi*, *Convolvuli*, and a great many more I cannot now Remember.

Now come we to their *People*. The *Men* are generally very Civil and Sagacious, have all of them good Faces, are of Low Stature, but very well Built; they are of a Copper-Colour, and have Black Hair; they us'd to go Naked, but are now as well Cloath'd as our ſelves; they wear a *Plate* of *Gold* in their *Noſe*, and a great many Rows of *Beeds* about their *Neck* and *Wriſts*.

The *Women* are generally the moſt Pitiful-like things that ever Man ſaw; their *Habit* Differs from the *Men*, for they ordinarily wear a *Ring* in their *Noſe*; they have *Petticoats*, and a *Vale* over their *Face*. They are under no Formal *Government*, but every Captain commands his own *River*, *Bay* or *Iſland* where he Lives, the greateſt of them all is one Captain *Ambroſio*, he Commands particularly the Country about the *Samballoes Point*, and when he pleaſes, he can Levy all the Men betwixt that and the *Gulf*, about 20 *Leagues*. There is another Capt. *Pedro*, that Lives in the Houſe with *Ambroſio*, and is his Nephew and Son-in-Law; there is a 3*d*. Capt. *Andreas*, that Commands the *River das Armas*; a 4*th* Capt. *Brandy*, that Commands about the *Golden Iſland*; a 5*th* Capt. *Andreas* that Commands the Country adjoyning to our Settlement; and a 6*th* Capt. *Pedro* his Conſort; a 7*th* Capt.

Pacigo, who Commands at *Carret Bay*, and Capt. *Diego* that Commands the *Gulph*. *Ambrosio* seems to be the greatest, and *Diego* next; both Old Men.

There is no such thing as a *King* or *Emperour* of *Darien*, nor, so far as we can gather from all the chief Men here about has been these 40 or 50 *Years*.

This Country certainly affords *Gold* enough, for besides that the Natives constantly assure us, that they Know several *Gold-Mines* on this side; besides that, I say, the *Plates* they Wear in their *Noses*, and the Quantity of *Gold* that is amongst them, is enough to perswade any Man of the Truth of it. There was one Night aboard here some *Indians* that had a *hundred Ounces* of *Gold* about them. We are certainly much bound to Providence in this Affair; for as we were searching for the Place we were directed to, we found this, and though the Privateers had been so often at *Golden Island*, and though *English*, *Dutch* and *French* had been all over this Coast, from *Portobello* to *Cartagena*, yet never one of them made the Discovery, even the *Spaniards* themselves never knew of this Place.

Observations in Mexico; *by*----- n. 130. p. 758.

XV. There were formerly near 80. *Towns* Seated round about the *Lake* of *Mexico*, some of which contained 5000 *Families*, and some above 10000. At the present there may be a matter of 30 *Burroughs* and *Villages*, of which the Greatest holds not above 500 *Houses*; all the rest having been Ruined by the *Revolutions* in that Country.

Observations in New-England; *by Mr.* J. Winthrop. n. 57. p. 1151.

XVI. 1. There is in *New England* in the Inland Country whole Forrests of a sort of *Dwarf Oak*, which though Low and Slender yet bear *Acorns*. The Husband-men find that sort of Land most difficult to Break up at first with their Plough, in regard that the whole Surface is fill'd with Spreading strong Roots of this sort of *Oak*. Neither must it be thought, that they are small Shoots, which in time would grow Big Trees; for, where these Grow there are no Great *Oaks*, or very few, amongst them. I have observed that in some Plains, full of these *Shrubs*, there have been no *Acorns* on most of them; but whether in other Years they were not fruitful, I knew not. Some Years we know, even the Great *Oaks* bear no Fruit, which are very full at other times.

Upon the *Bark* of a certain Tree growing in *Nova Scotia*, and (as I hear) in the more Easterly Parts of *N. England*, there are little Knobs, within which there is a Liquid matter like *Turpentine* (which will run out, the Knob being cut open) of a very *Sanative* Nature, as I am Credibly informed.

The *Pods* of *Silk-Grass* are full of a kind of most fine *Down* like *Cotton-Wool*, many such Flocks in one and the same Pod ending in a Flat Seed. 'Tis used to stuff up Pillows and Cushions; being tryed to Spin, it proves not strong enough.

The

The *Down* alſo of the *Cotton-Tree* is not fit to *Spin*. Theſe Trees grow High and Big. At the bottom of ſome of the *Leaves*, next to the Stalk of them, is a knob which is Hollow, and a certain *Fly*, ſomewhat like a *Piſmire-Fly*, is bred therein.

Thoſe *Shells*, of which the *Indians* make the *White Wampan-peage*, one ſort of their *Money*, are bred in *Matrices* growing on the bottom of Sea-bays. They are like *Periwinkles*, but Greater. Whilſt they are very Small, and firſt Growing, Many of them are within One of the Concave Receptacles of theſe *Matrices*, which are very Tough and Strong, ſo Contrived, that they are ſeparate from one another, yet ſo, that each of them is faſtened to a kind of *Skin*, Subtended all along to all theſe *Caſes* or *Baggs*.

2. The *Plague of the Back* is greatly diſtant from an *Empyema*. It ſeems more of a *Collick*, yet is undoubtedly a *Nervous Dolour*. The Country People have learned of the *Indians* to ſteep *Caſtoreum* in *Rum*, and ſo *Cure* it. *By Mr. Benjam. Bullivant, n. 240. p. 167.*

As to the *Fire-Flies*, I took ſeveral of them in *July* 1697. I take them to be a *Glow-Worm Volant*; the *Luſter* is Placed as in a *Glow-Worm*. Kill the *Fly* (as I have done) and you'll find the *Scintilla* a ſmall Jelly-like Subſtance, the which ſeparated into Atoms, gives ſtill, in the Dark, a *Luſter* proportionable to the Magnitude of each Atom.

I ſaw *Butter-flies-Eggs* that were *Teſtaceous*, and near as big as a *Wren's*, moſt glorioufly *Beſtudded* with Gold and Silver; at *Road-Iſland* the Mowers find them in the *Graſs*, and they Hatch in the Windows and are a Sport for Children.

Tortoiſes are *Amphibious*, I have found their *Eggs* by Ponds ſides, in great Quantities, they are without *Shells*, like thoſe in a *Hen's Belly*; our Dames Scruple not to uſe them as *Hen's Eggs* in Puddings.

Graſhoppers in Dry Years, are a Plague to the Husband-men: That on ſome Iſlands they have put multitudes of *Turkeys* to Deſtroy them; they are Prodigious in Quantity, of a Grey Colour, and about 3 *Inches* long; in *July* become *Volant*, and have a kind of *Regimental* Diſcipline, and as it were, ſome *Commanders* which ſhew Greater and more Splendid *Wings* than the *Commoners*, and Riſe firſt when they are purſued by the Fowls, or by the Foot of the Travailer.

The *Hum-bird* I have ſhot with Sand, and had one ſome Weeks in my keeping. I put a Straw for a Perch into a Venice Glaſs Tumbler, tyed over the Mouth with a Paper, in which I cut Holes for the Bird's Bill (about as long and as ſmall as a Taylor's Needle) and laying the Glaſs on one ſide, ſet a *Drachm* of *Honey* by it, which it ſoon Scented, and with its Long Tongue put forth beyond its Bill fed daily; it muted the *Honey* Pure.

We have a *Frog* as big as a Penny Loaf, its *Cry's* exactly like a *Bull*. I have examined the *Clam*; he hath a *Plain Pipe* or *Proboſcis*, from whence he Ejects Water, if Compreſſed.

The Advantage of Virginia *for* Building Ships; *by*---------- n. 93. p. 6015.

XVII. *Virginia* abounds all over, 1. With Large Tall *Oaks* of at leaſt 50 or 60 *Feet* in Height of Clear Timber, without Boughs or Branchings; being very fit to make *Plank* of any ſize, very Tough and excellently well enduring the Water;

2. With abundance of *Pines* for *Maſts*: and with another ſort of Wood call'd *Cypreſs*, which is far better than any *Pine* for *Maſts*; it being of as Tough and Springy a Nature as *Yew-Tree*, bending beyond Credit; when *Dry* much Lighter than Firr; and ſo well Laſting in *Wet and Dry*, that it ſeems rather to Poliſh than Periſh in the Weather;

3. With *Old Pines* for making of *Roſin*, *Pitch* and *Tar*;

4. With the Conveniency of Planting *Hemp* for *Cordage* and *Sail-Cloths*;

5. With great Plenty of *Iron-Stone*, which hath been Try'd and found very Good; the Conveniency of *Wood* and *Lime-Stone* being a good Inducement to the *Making* of *Iron*, which might be done at a much Cheaper Rate there than in *England*.

An Account of Virginia; *by Mr* Tho. Glover. n. 126. p. 623.

XVIII. *Virginia* being a part of the Continent of *America*, is diſtant from the *Lizard* or *Lands end* of *England* 1000 *Leagues*, and is bounded on the *Eaſt* with the Main *Ocean*, on the *Weſt* with the *Appal-lean* Mountains, on the *North* with *De-la-ware's-Bay* and *River*, and on the *South* with the River of *Roanoak*; the Country lyeth within a Bay called the *Bay* of *Chiſepeek*; the Mouth or Entrance whereinto is due *Weſt*, being about 6 *Leagues* in Breadth, and runneth up into the Country *North* and by *Eaſt* about 100. *Leagues*, continuing the forementioned Breadth a great part of the way, but narroweth by Degrees towards the Upper end about one Half. The Water in the *Channel* is for the moſt part 9 *Fathom*, but in ſome places not above 7. The *Southernmoſt Cape* of this *Bay* lieth in 37 *Deg.* and odd *Min.* North Latitude: and within the ſame are divers little Iſlands, upon ſome of which there are Plantations.

Into this *Bay* do Iſſue ſo many Large, Pleaſant and Commodious Rivers, as I verily believe no ſpace of Ground of equal Dimenſions in the whole World can boaſt of the like: The moſt Eminent of theſe are, *James* River, *York*, *Rapahanock*, *Potomack*, *Potuxen*, and *Choptanck*; the four laſt Retain their *Indian* Names. At the *Head* of the *Bay* do enter 3 Large Rivers; one whereof is called *Suſ-cahannah*, from a Nation of *Indians* ſo called, bordering on the ſame. Beſides theſe there are twice as many, as Navigable as theſe, but by reaſon they run not above 30 or 40 *Miles*, I ſhall forbear inſerting any of their Names.

Potomack, the Largeſt of all the reſt, is at the Mouth 10 *Miles* Broad, and continueth that Breadth for 20 *Miles* up; from which Place it is 6 *Miles* Broad, and continueth that Breadth for 30 *Miles* Higher, and is in Length about 200 *Miles*. This River lyeth about the middle of the *Bay*; The other Rivers whoſe Names are here inſerted, are moſt of them 2 *Leagues* Broad at the Mouth, and ſome of them 150, others 120 *Miles* in Length.

The *Tides* are ſcarce Diſcernible, when the Winds hold at *North-West*; but at other times they flow as they do in *England*, only they appear not ſo Large; the reaſon whereof may be, becauſe the *Tide* Diffuſeth it ſelf into ſo many Spacious Rivers.

In the Rivers are great Plenty and Variety of delicate *Fiſh*; one Kind whereof is by the *Engliſh* call'd a *Sheep's-head*, from the reſemblance the Eye of it bears with the Eye of a *Sheep*: This *Fiſh* is generally about 15 or 16 *Inches* long, and about *half* a *Foot* broad; it is a Wholeſome and Pleaſant *Fiſh* and of eaſy Digeſtion.

There is another ſort which the *Engliſh* call a *Drum*; many of which are 2 *Foot* and a *half* or 3 *Foot* long. This is likewiſe a very Good Fiſh, and there is great plenty of them. In the Head of this Fiſh there is a Jelly, which being taken out and Dry'd in the Sun, then beaten to Powder and given in Broth, procureth ſpeedy *Delivery* to *Women in Labour*.

At the Heads of the *Rivers* there are *Sturgeon*, and in the *Creeks* are great ſtore of Small *Fiſh*, as *Perches*, *Crokers*, *Taylors*, *Eels*, and divers others whoſe Names I know not. Here are ſuch plenty of *Oyſters* as they may Load Ships with them. At the Mouth of *Elizabeth* River, when it is Low-water, they appear in Rocks a Foot above Water. There are alſo in ſome places great ſtore of *Muſcles* and *Cockles*; there is alſo a *Fiſh* call'd a *Sting Ray*, which much reſembleth a *Skate*, only on one ſide of his *Tail* grows out a ſharp Bone like a Bodkin about 4 or 5 *Inches* long, with which he Strikes and Wounds other *Fiſh*, and then Preys upon them.

About a Year before I came out of the Country, as I was coming down *Rapahannock* River in a Sloop, bound for the *Bay*, 3 *Leagues* ſhort of the River's Mouth, being left alone in the *Sloop*, I heard a great Ruſhing and Flaſhing of the Water, which caus'd me ſuddenly to look up, and about half a Stone's-Caſt from me appear'd a moſt Prodigious Creature, much reſembling a *Man*, only ſomewhat Larger, ſtanding right up in the Water, with his Head, Neck, Shoulders, Breaſt, and Waſte to the Cubits of his Arms, above Water. His Skin was Tawny, much like that of an *Indian*; the Figure of his *Head* was *Pyramidal*, and Slick, without *Hair*; his *Eyes* Large and Black, and ſo were his *Eye-brows*; his mouth very Wide, with a broad black Streak on the *Upper Lip*, which turn'd Upwards at each end like Muſtachoes; his *Countenance* was Grim and Terrible; his *Neck*, *Shoulders*, *Arms*, *Breaſt* and *Waſte*, were like unto the Neck, Shoulders, Arms, Breaſt and Waſte of a *Man*; his *Hands*, if he had any, were Under-Water; he ſeem'd to ſtand with his *Eyes* fix'd on me for ſome time, and afterward Dived down, and a little after he roſe at ſomewhat a farther Diſtance, and Turn'd his *Head* toward me again, and then immediately falleth a little under water, and Swimmeth away ſo near the top of the Water, that I could diſcern him throw out his *Arms*, and gather them in as a *Man* doth when he *Swimmeth*. At laſt he Shoots with his Head downwards, by which means he Caſt his Tail above the Water, which exactly reſembled the *Tail* of a *Fiſh* with a Broad *Fin* at the End of it.

On the *Bay* and *Rivers* feed ſo many *Wild Fowl*, as in Winter-time they do in ſome places Cover the Water for 2 *Miles*; the chief of which are Wild *Swans* and *Geeſe*, *Cormorants*, *Brants*, *Shield-fowl*, *Duck* and *Mallard*, *Teal*, *Wigeons*, with many others.

There likewiſe keep in the Rivers *Bevers* and *Otters*; the *Bevers* have their Teeth ſo Strong and Sharp, that they Gnaw down Trees, wherewith they make *Damms* croſs the Waters, under which they Keep, which are uſually call'd *Bever-Damms*, and in ſome places ſerve in the Room of *Foot-Bridges*.

The Original Springs, that make all theſe *Rivers*, ariſe at the *Foot* of the *Appal-lean Mountains*; but the *Cataracts* or *Falls* of theſe Rivers are 60 or 70 *Miles* Diſtant from the *Mountains*.

Theſe *Mountains* have their Beginning Northward at the Lake of *Canada*, and run all along the Back of the Country to the South Weſt as far as the Lake *Uſherre*, which is ſome *Hundreds* of *Leagues*.

There was one Coll. *Catlet*, that was a good Mathematician, who with ſome other Gentlemen took a Journey to make ſome further Diſcoveries of the Country to the Weſtward, and arriving at the *Foot* of the *Mountains* early in the Morning, they left their Horſes and endeavour'd to gain the *Tops* of the *Mountains*, which they accompliſh'd about 4 of the Clock in the Afternoon, and then looking further forward, they Diſcover'd other *Mountains*, whereof they took the *Altitude* and judg'd them Inacceſſible; which diſcourag'd them from any further Attempts.

Above 5 Years ſince there was a *German* Chirurgeon who obtained a Commiſſion from Sir *Will. Bartlet* to Travel to the *South-Weſt* of *Virginia*, and to make Diſcoverie of thoſe Parts. He went along the *Foot* of the *Mountains* as far as the Lake *Uſherre*, and diſcovered them to be Paſſable in Two Places; and he gives a relation, that, while he was in an *Indian* Town adjacent to the *Mountains*, there came 4 *Indians* on an Embaſſie to the King of that Town, from a King that Lived on the other ſide of the *Mountains*.

At his Return he brought an *Emerald*, and ſome *Spaniſh Money*, which he ſaid he had of the Indians bordering on the *Lake* of *Uſherre*; which cauſed ſome to think that ſome *Spaniards* are ſeated near upon the Back of theſe *Mountains*.

The Shoars all along the *Bay* and *Rivers* are for the moſt part *Sandy*, but only in ſome Points there is ſome *Shingle* caſt up: but the *Earth* affordeth very few *Stones*, and thoſe that are there, are almoſt all of them Hard and Tranſparent. I have taken up ſeveral *Stones*, that would cut Glaſs as well as any *Diamond*: and I do verily think, that there are ſome *Stones* gathered there that do abate the Price of *Diamonds*; for I have ſeen ſeveral Rings of *Virginia-Stones*, which in my Judgment have equalled *Diamonds* in *Luſter*.

The Cliffs of all the Rivers are full of great Veins of *Iron-mine*, and in ſome Places of the Country I have ſeen Rocks of the ſame to lye a *Foot* above the Earth; and generally all the Highlands under the Mould are a

meer

meer Rock of *Iron*: But an *Iron-work* would coſt 3000 *l.* and the Country being generally Poor, they were Diſcouraged from *Running* this *Mineral* by reaſon of the Charge: Tho' I believe the true Reaſon is, their being ſo Intent on their *Tobacco-Plantations* that they neglect all other more Noble and advantageous Improvements.

They diſtinguiſh their *Soil* into 3 ſorts, *viz. High*, *Low* and *Marſhy* Land; all which have ſome *Sand* mixed in them, that makes their Land Warmer than ours in *England*. There *High-Lands* are moſt *Sandy*, but do notwithſtanding bear very good Crops of *Tobacco*; only it does not Hold its Strength ſo long as the *Low Ground*, which is very Rich, being a Blackiſh Mould about a *Foot* Deep, or ſome what more, and will Hold its Strength for 7 or 8 Crops ſucceſſively without *Manuring*. Their *Marſh Lands* bear Sedges and Ruſhes after the manner of ours; and of theſe they have not endeavoured any Improvement as yet. Their Land in General is as Good and Fertile as the Land of *England*. When the Strength of their Ground is Worn out they never *Manure* it to bring it in Heart, but let it lie for Paſture for all Mens Cattle to Graſe upon, and *Clear* more Ground out of the Woods to *Plant* in.

As to the *Timber* of this Country, there are divers kinds; 4 ſeveral ſorts of *Oak*, very Tall and Smooth. There is alſo another ſort of *Timber* called *Hickery*, that is harder than any *Oak*. There are alſo very Large and Tall *Poplars*, and in ſome parts of the Country great Store of *Pines*, fit for *Maſts* of *Ships*. There is likewiſe *Black Walnut*, *Cypreſs*, *Cedar*, *Dogwood*, *Aſh*, *Elm*, *Gum-Tree*, *Locuſt*, *Cheſnut*, *Haſel*, *Saſſafras*, *Holly*, *Elder*, with ſeveral others.

As to the *Fruit-Trees* of the Country, it affords great Plenty: For there are few *Planters* but that have fair and large *Orchards*, ſome whereof have 1200 Trees and upward, bearing all ſorts of *Engliſh Apples*, as *Pear-mains*, *Pippins*, *Ruſſetins*, *Coſtards*, *Marigolds*, *Kings-Apples*, *Magitens*, *Batchelours*, and many others, of which they make great ſtore of *Cider*.

Here are likewiſe great *Peach-Orchards*, which bear ſuch an infinite quantity of *Peaches*, that at ſome *Plantations* they beat down to the *Hoggs* 40 *Buſhells* in a *Year*.

Here are alſo great ſtore of *Quinces*, which are larger and Fairer than thoſe of *England*, and not ſo Harſh in Taſte; of the Juice of theſe they make alſo *Quince-drink*.

Here are likewiſe *Apricocks*, and ſome ſort of *Engliſh Plums*, but theſe do not Ripen ſo Kindly as they do in *England*.

There are ſome ſorts of *Pears*: but at very few *Plantations*; I have ſeen the *Bergamy*, *Warden*, and 2 or 3 other ſorts, and theſe are as Fair, Large and Pleaſant as they are in *England*.

Here grow as good *Figs*, as there do in *Spain*, but there are few Planted as yet.

Thoſe that take the Pains to Plant *Gooſe-berries*, have them; but I never ſaw any of our *Engliſh Currants*, (*Riberries*) there: and it is obſerved, that *Oranges* and *Limons* will not Grow there, though they do in more Northern Countries.

I had almoſt forgot to mention their *Mulberry-Trees*, whereof they have good Store about their Houſes; theſe were Planted at firſt to feed *Silk-Worms*, but that Deſign failing, they are now of little Uſe amongſt them.

The Meaneſt *Planter* hath ſtore of *Cherries*, and they are all over *Virginia* as Plentiful as they are in *Kent*. The *Cherry-Trees* grow more Large generally than they do in *England*, and *Bear* more Plentifully without any Pains taking of *Digging* about them, or *Pruning* them.

There groweth Wild in ſome places of the Woods a *Plum* ſomewhat like our *White Plum*, but it doth Exceed it, being much more Succulent.

In the Woods there are abundance of *Vines*, which Twine about the *Oaks* and *Poplars*, and run up to the Top of them; theſe bear a kind of *Claret-Grapes*, of which ſome few of the *Planters* do make *Wine*, whereof I have taſted; it is ſomewhat ſmaller than *French-Clarret*,; but I ſuppoſe, if ſome of theſe *Wines* were Planted in convenient *Vineyards*, where the Sun might have a more kindly Influence upon them, and kept with Diligence and ſeaſonable *Pruning*, they might afford as good *Grapes* as the *Claret-Grapes* of *France* are.

There is alſo in the Woods a little *Shrub* which Beareth a *Berry* like our *Elder-Berry*, and is a very Pleaſant *Berry* to Eat.

Here is a Tree call'd a *Chincopine*, which is like a *Cheſnut*, with a *Burry Husk*, but leſs by far.

Their *Gardens* have all ſorts of *Engliſh Pot-Herbs*, and *Sallets*; they have *Cabbages*, *Coleworts*, *Colly Flowers*, *Parſnips*, *Carrots*, *Potatoes*, and *Yams*; and ſuch *Herbs* as grow Wild in *England*, and do not Grow there, they Plant, as *Wormwood*, *Fetherfew*, *Houſeleek*, *Carduus Benedictus*, *Rue*, *Coriander*, *Enula*, and the like.

They have likewiſe in their *Gardens* *Roſes*, *Clove-Gilliflowers*, and variety of other ſort of *Flowers*.

There grow Wild in the Woods, *Plantane* of all ſorts, *Yellow-Dock*, *Burdock*, *Solomons-Seal*, *Egrimony*, *Centory*, *Scabious*, *Ground-ſell*, *Dwarf Elder*, *Yarrow*, *Purſlain*, and *White Maiden-Hair* the beſt that ever I ſaw. Upon the ſides of the Hills, *Aſarum*; and on the Bay-ſide, *Soldanella* or *Sea-Scurvygraſs* in great Plenty. Here groweth the *Radix Serpentaria Nigra*, which was ſo much uſed in the Laſt Great *Peſtilence*, that the Price of it advanced from 10 *Shillings* to 3 *Pounds ſterling*, a *Pound*: Here is alſo an *Herb* which ſome call *Dittany*, others *Pepper-wort*; it is not *Dittany* of *Candia*, nor *Engliſh Dittander*; it Groweth a *Foot* or a *Foot* and *half* High, the *Leaves* are about the Breadth of a Groat, and Figured like a *Heart*, and ſhoot out of the *Stalk* and *Branches* one of a ſide directly Oppoſite to each other, it Smelleth Hot like *Pepper*, and Biteth upon the Tongue. The *Water* of this Herb *Diſtill'd* out of a *Limbeck*, is one of the beſt things I know to Drive *Worms* out of the Body; and an *ounce* of this *Water* taken, Provoketh *Sweat* Plentifully.

Here grow two Roots, which ſome Phyſicians judge the one to be *Turbith*, the other *Mechoacan*; but whether they be the Right or no, I could not well judge. Both theſe Roots are *Purging*, and in their Operations much

much like those we have at the *Apothecaries*, only somewhat more Forcible; the Reason may be, because there we have them more New and *Succulent*.

Here groweth a Plant about a *Foot* and a *half* or *two Foot* in Heighth; the *Leaves* are Rugged like to a *Borage* Leaf, but they are Longer, and not above 2 *Fingers* Broad; about the *Stalk*, where the *Leaves* grow out, there hang *Berries*, which being Ripe are *Yellow*; The *English* call it the *Fever* and *Ague-Root*. This Root being newly taken out of the Ground, and a *Dram* and a *half* of it Infus'd in Beer or Water the space of 12 *Hours*, *Purgeth* downwards with some Violence; but I have given a *Dram* of the *Root* in Powder, and then it only Moveth *Sweat*, and that but Moderately. It is a little *Bitter* in Taste, and therefore somewhat Hot.

All that the Inhabitants give their *Cattel* in Winter is only the Husks of their *Indian Corn*, unless it be some of them that have a little *Wheat* Straw; neither do they give them any more of these than will serve to keep them Alive, by reason whereof they venture into the *Marshy* Grounds and *Swamps* for Food, where very many are *Lost*.

They have as great plenty of *Horses*, and as good as we have in *England*.

As to their *Sheep*, they Keep but Few, being discourag'd by the *Wolves*, which are all over the Country, and do much Mischief amongst their Flocks.

In the *Woods* are great store of *Deer*, and some *Rabbets*, which are generally mistaken for *Hares*.

There are also several sorts of *Ravenous Beasts*, as *Wolves*, *Racoons*, *Wild-Cats*, *Possums*, *Monacks*, *Flying Squirrels*, with two other Sorts; and in the Northernmost Parts of the Country some *Bears*.

The *Fowls* that keep the *Woods* are *Wild Turkies*, *Turky Buzzards*, *Turtle-Doves*, *Partridges*, *Hawks* of several sorts, with many others of less Note.

There are also divers Kinds of *Small Birds*, whereof the *Mocking-Bird*, the *Red-Bird* and *Humming-Bird*, are the most Remarkable; the first for *Variety* and *Sweetness* of *Notes*, the Second for his *Colour*, and the Last for the *Smallness* of his Body. As to the *Mocking-Bird*, besides his own Natural *Notes*, which are Many and Pleasant, he *Imitateth* all the *Birds* in the *Woods*, from whence he takes his Name; he *Singeth* not only in the Day, but also at all Hours in the Night, on the Tops of the Chimneys; he is strangely Antick in his *Flying*, sometimes Fluttering in the Air with his Head right down and Tail Up, other times with his Tail down and Head Up; being kept Tame, he is very Docible. The *Red-Bird*, as I hinted before, taketh his Name from his *Colour*, being all over of a Pure *Blood-Red*. The *Humming-Bird* taketh his Name from the *Noise* he makes in *Flying*: This is of divers *Colours*, and not much bigger than a *Hornet*, and yet hath all the Parts of a *Bird* Entire.

There are 5 or 6 Sorts of *Snakes*, amongst which the *Rattle-Snake* is most Remarkable, being about the Bigness of a Man's Legg, and for the

moſt part, about a *Yard* and a *half* long; he hath a *Rattle* at the end of his *Tail*, wherewith he maketh a *Noiſe* when any one approacheth nigh him, which ſeemeth to be a peculiar *Providence* of *God* to warn People to avoid the Danger; for this Creature is ſo *Venemous*, that the Bite of it is of moſt Dangerous Conſequence, unleſs they ſpeedily make Uſe of the Proper *Antidote*. There are alſo Long *Black Snakes*, Short and Thick *Black Snakes*; this latter ſort oftentimes *Sucks* the *Cows*, and cauſes them to give *Bloody Milk*. There is another ſort is call'd the *Corn-Snake*, becauſe he is uſually found in *Corn-Fields*; this is near as big as the *Rattle-Snake*. There are alſo ſome other ſort of *Land-Snakes*, all of which are, more or leſs, *Venemous*; beſides, there are very many *Water-Snakes*, that keep the *Springs* and *Rivers*.

The *Indians* are generally well Proportion'd as to their *Stature*, being ſomewhat Tall, but no ways Corpulent; their Hair Black, uſually hanging Right Down; their Eyes alſo Black, and their Skin Tawny, inclining to Blackiſhneſs. They Live together in *Towns*, and every *Town* is under a ſeveral *King*. At the firſt coming of the *Engliſh* divers *Towns* had 2 or 3000 *Bow-men* in them: but now, in the *Southern* Parts of *Virginia*, the Biggeſt *Indian Town* hath not above 500 *Inhabitants*; many *Towns* have ſcarce 60 *Bow-men* in them, and in one *Town* there are not above 20; and They are ſo Univerſally Thinn'd in the fore-mention'd *Southern* Parts, that I verily believe there are not above 3000 Left under the whole Government of Sir *Will. Bartlet*; but in my Lord of *Baltimore's* Territories at the *Head* of the *Bay*, where the *Engliſh* were Later Seated, they are more Numerous, there being ſtill in ſome *Towns* about 3000 *Indians*. But Theſe being in continual Wars with each other, are like ſhortly to be Reduc'd to as Small Numbers as the Former.

Inſtead of *Cloaths* they wear a *Deer-Skin* tuck'd about their Middle, and another about their Shoulders, and for *Shoes* they have pieces of *Deer-Skin* ty'd about their *Feet*.

Their Habitations are *Cabins*, about 9 or 10 *Foot* High, which are made after this manner: They fix *Poles* into the Ground, and bring the Tops of them one with another, and ſo Tie them together: the Outſide of theſe *Poles* they Line with *Bark* to defend them from the Injuries of the *Weather*, but they leave a Hole on the Top, right in the middle of the *Cabin* for the *Smoak* to go out. Round the Inſide of their *Cabins* they have *Banks* of *Earth* caſt up, which ſerve inſtead of *Stools* and *Beds*. They have no kind of *Houſhold-ſtuff* but *Earthen Pots*, *Wooden Bowls*, and Thin Matts to lie on; all which they Make themſelves.

Their *Diet* is *Indian-Corn*, *Veniſon*, *Wild-Turkies*, *Oyſters*, and all kind of *Fiſh* the *Rivers* afford; and all kind of *Wild Beaſts* of the *Woods*.

They are *Prohibited* the keeping either *Cows*, *Sheep* or *Hoggs*, by the *Engliſh*, leſt they ſhould make bold with more than their Own.

They did formerly *Catch* their *Fiſh* after an odd manner before the *Engliſh* came amongſt them, which was thus: At the *Head* of their *Canoes* they fix'd a Hearth, on which in a Dark Night they would make a *Blaze* with

with *Fire* put to the Shivers of Pine Tree; and they would *Paddle* their *Canoes* along the Shoar in Shoal-water; the *Fiſh* ſeeing the *Light* would come as thick as they could Swim by each other, about the *Head* of the *Canoes*; then with Sticks that were Pointed very Sharp at the Ends, they would ſtrike through them and lift them up into the *Canoe*: But now they have learn'd of the *Engliſh* to Catch *Fiſh* with *Hook* and *Line*, and ſometimes the *Engliſh* do Uſe Their Way in Dark Nights, only they Strike with an Inſtrument of Iron ſomewhat like *Mole-Tines*.

They have *Prieſts*, which are generally thought to be *Conjurers*; for when they have great want of *Rain*, one of their *Prieſts* will go into a Private *Cabin*, and by his Invocations will cauſe abundance to fall Immediately, which they call *Making of Rain*.

They *Offer* the *Firſt-Fruits* of all things; the *Firſt Deer* they Kill after they are in Seaſon, they lay Privately on the Head of a Tree near the Place where they Kill'd it, and they ſay, no *Good-Luck* will befall them that Year if they do not *Offer* the *Firſt* of every thing.

They *Burn* the Bodies of the *Dead*; and Sew up the *Aſhes* in *Matts*, which they Place near the *Cabins* of their *Relations*.

Some of them ſay, That the *God* of the *Engliſh* is a *Good God*, and gives them Good things; but *Their God* is an *Angry God*, and oftentimes Beats them.

Almoſt every *Town* Differs in *Language*, and yet not any of their *Languages* Copious; as may be ſeen by their frequent Expreſſing their Meaning to each other by *Signs*.

Their *Money* is of *Two* Sorts; *One* whereof is made of a *White* kind of *Shell*, which being Divided into Small Parts, they put them on a *String* after the manner of *Beads*; this they call *Peacke*: The *other* is of a *Blue Shell* order'd in the ſame manner, which they call *Rounda*; this Laſt is the meaner ſort, about *half* a *Yard* whereof is of equal Value with our *Nine Pence*. The *Chief* of the *Indians* do *Wear* ſome of this on the *Deer Skins* about their Bodies, laid on like *Lace*.

They have nothing to *Trade* with but *Deer Skins*, and ſome *Bever*, which they Exchange with the *Engliſh* for *Guns*, *Gun-powder*, *Shot* and *Brandy*; having nothing before but *Bows* and *Arrows*, wherewith they Kill'd their *Deer* and other *Wild Beaſts*.

They have no other Account of *Time* but by the *Changes* of the *Moon*.

Their *Winter* is uſually in *November*, *December* and *January*.

They are very *Revengeful*; for, if any one chance to be *Slain*, ſome of the *Relations* of the Slain Perſons will *Kill* the *Murtherer* or ſome of his *Family*, though it be 2 or 3 Generations after, having No *Juſtice* done amongſt them in this reſpect but what Particular Perſons do themſelves; if that may be Term'd *Juſtice*.

The *Indians* being a Rude ſort of People uſe no Curioſity in Preparing their *Phyſick*; yet are they not Ignorant of the Nature and Uſes of their *Plants*,

Plants, but they Uſe no *Correctives* to take away the *Flatuous*, *Nauſeous* and other bad *Qualities* of them.

Their uſual way of *Cure* for moſt *Inward Diſtempers* is by *Decoction*, which they make partly *Pectoral*, partly *Sudorifick*; Theſe they cauſe the *Sick* to Drink, the Quantity of *half* a *Pint* at a time, two or three times a Day; but they give nothing to procure *Vomiting* in any *Diſtempers*, as a bad Omen that the *Diſeaſed* will *Die*; neither did I ever know them to Uſe any wayes af *Blooding* or *Cupping*.

If they have any *Woumds*, *Ulcers* or *Fractures*, they have the Knowledge of *Curing* them. I did once ſee an *Indian* whoſe Arm had been *Broken*, and viewing the Place I found the *Bones* to be as *Smoothly Conſolidated*, and as well *Reduced*, as any *Engliſh Chirurgeon* could have done it.

All *Indians* carry a Powder about them, to *Cure* the *Bites* of *Snakes*, and in almoſt every *Town* this Powder hath a *Different Compoſition*, and every Compoſition is certainly Effectual to the Correcting the Malignity of the *Venom*. Neither was it ever known to us, that any *Indian* Suffered much harm by theſe *Bites*, but in a Day's time he would be as well as if he had never been *Bitten*: Whereas ſome of the *Engliſh* for want of a ſpeedy Remedy have loſt their Lives.

The *Indians* are frequently Troubled with Violent *Colicks*, which often times terminate in *Palſies*.

The Manner of *Planting* and *Ordering Tobacco* is thus. In the *Twelve Days* they Begin to *Sow* their Seed in *Beds* of Fine Mould, and when the *Plants* be grown to the Breadth of a *Shilling*, they are fit to *Replant* into the *Hills*; for in their *Plantations* they make ſmall *Hills* about 4 *Foot* Diſtant from each other, ſomewhat after the manner of our *Hop-yards*. Theſe *Hills* being prepared againſt the *Plants* be Grown to the forementioned bigneſs (which is about the beginning of *May*,) they then in Moiſt Weather Draw the Plants out of their Beds, and Replant them in the *Hills*, which afterward they keep with diligent *Weedings*. When the *Plant* hath put out ſo many *Leaves* as the Ground will Nouriſh to a Subſtance and Largeneſs that will render them Merchantable; then they take off the *Top* of the *Plant*: If the Ground be very Rich, they let a *Plant* put out a *Dozen* or 16 *Leaves* before they *Top* it; if Mean, then not above 9 or 10, and ſo according to the Strength of their Soil. The *Top* being taken off the Plant Grows no Higher: but afterwards it will put out *Suckers* between their *Leaves*, which they pluck away once a Week, till the *Plant* comes to Perfection which it doth in *Auguſt*. Then in Dry Weather, when there is a little *Breeze* of Wind, they Cut down what is Ripe, letting it lie about 4 *Hours* on the Ground, till ſuch time as the *Leaves*, that ſtood ſtrutting out Fall down to the Stalk, then they Carry it on their Shoulders into their *Tobacco Houſes*, where other Servants taking of it, drive into the Stack of each *Plant* a Peg, and as faſt as they are Pegg'd, they hang them up by the Pegs on *Tobacco-Sticks*, ſo nigh each other that they juſt Touch, much after the manner they Hang *Herrings* in *Yarmouth*; thus they let them Hang 5 or 6 *Weeks*, till ſuch time as the *Stem* in the Middle of the *Leaf* will Snap in the

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Bending of it; then, when the Air hath ſo Moiſtened the *Leaf* as that it may be Handled without Breaking, they ſtrike it down, *Strip* it off the *Stalk*, Bind it up in Bundles, and Pack it into *Hogſheads* for Uſe.

Sometimes they are forced to *Plant* their *Hills Twice* or *Thrice* over, by reaſon of an *Earth-Worm* which Eats the Root: and when the *Plant* is well Grown, they ſuffer Damage by a *Worm*, that Devours the *Leaf*, call'd a *Horn-Worm* (an *Eruca* or *Caterpillar*) which is Bred upon the *Leaf*; if theſe *Worms* be not carefully taken off, they will Spoil the whole Crop.

In the *Year* 1667. in *Auguſt* there happened all over *Virginia* a *Guſt* or Storm of *Wind* and *Rain*, which continued for 3 *Days* with ſuch Violence that the like was hardly ever Heard of: it Began and Continued Blowing at *Eaſt* with ſuch Fierceneſs, that above one Half of the Crop of their *Tobacco* which was then ſtanding in their Fields, was Blown away and Torn apieces; the *Trees* in the *Woods* all over the Country were Blown up by the *Roots* in an Innumerable Quantity: The *Waters* in the *Bay* in ſome places were Drove a great way into the *Woods*, and the greateſt part of thoſe that Houſed *Tobacco*, had their *Tobacco Houſes* Blown down and their *Tobacco* Spoil'd; ſo that there was not fully *one* part of 3 Saved of what would have been made that *Year*.

The *Planters-Houſes* are Built all along the *Sides* of the *Rivers* for the Conveniency of Shipping; they *Build* after the *Engliſh* manner, *Whiting* the inſide of their *Houſes* with Mortar, made of *Burnt Oyſter Shells* inſtead of *Lime*.

They have Pure and Wholſome *Water*, which they fetch wholly from *Springs*, whereof the Country is ſo Full, that there is not a *Houſe* but hath one nigh the Door.

XIX. The Veſſel, in which we ſet Sail for *Virginia*, being of about 200 or 250 *Tuns*, Sprung a conſiderable *Leak*. The Capt. had tryed all Methods that Seamen uſe upon ſuch occaſions to find the *Leak*; particularly they applyed *Cans* to their Ears to Hear with; but all in vain: The working of the Ship, the Tackle and the Sea made ſuch a Noiſe, that they could diſcover nothing thereby. I then happily bethought my ſelf of a ſpeaking *Trumpet* I had contrived for ſome other Conveniences, of a Differing Shape from the common ſorts: I bid him take it, and apply the Broad End to the ſide of the Ship, the Narrow End to his Ear, and it would encreaſe his Hearing as much as it Augmented the Voice the other way, and would Ward the Ear too from the Confuſion of Forreign Noiſe. Upon the firſt Application, accordingly they Heard it, tho' it happened to be at a conſiderable Diſtance: and when they removed the Trumpet nigher, they heard it as if it had been the Current of a Mighty River. So that Cutting there the *Cieling* of the Ship, they immediately ſtopt the *Leak*.

A Voyage to Virginia; and an Account of that Country; by Mr. J. Clapton.n.201 p. 781.

In the Sea I ſaw many little things which the Seamen call *Carvells*; they are like a *Jelly* or *Starch* that is made with a Caſt of *Blew* in it; they Swim like a ſmall Sheep's Bladder above the Water, Downwards there are long *Fibrous* Strings, ſome whereof I have found near *half* a *Yard* long. This

I take to be a ſort of *Sea Plant*, and the Strings its *Roots* growing in the *Sea*, as *Duck-Weed* does in *Ponds*. It may be reckon'd amongſt the *Potential Cauteries*: for when we were one Day Becalm'd, the ſportful People rubb'd it on one anothers Hands and Faces, and where it Touch'd it would make it look very *Red*, and make It Smart worſe than a *Nettle*. In my return for *England* we ſtruck a *Hawksbill-Turtle*, in whoſe Guts I found many of theſe *Carvels*: So that 'tis manifeſt they Feed thereon.

The Air. The Cape call'd *Cape Henry*, lies in 36½. of the *North Latitude*. The *Air* and Temperature of the *Seaſons* is much Govern'd by *Winds* in *Virginia*, both as to *Heat* and *Cold*, *Dryneſs* and *Moiſture*, whoſe Variations are very Notable, there being often Great and Sudden Changes; The *North* and *North-Weſt* are very *Nitrous* and Piercing, Cold and Clear, or elſe Stormy: The *South-Eaſt* and *South*, Hazy and Sultry Hot. Their *Winter* is a Fine Clear Air, and Dry, which renders it very Pleaſant; Their *Froſts* are Short, but ſometimes ſo very Sharp, that it will Freeze the *Rivers* over 3 *Miles* Broad; nay, the *Secretary* of *State* aſſur'd me, that it had frozen clever over *Potomack* River, over againſt his Houſe, where 'tis near 9 *Miles* broad. I have obſerv'd it Freezes there the Hardeſt, when from a Moiſt *South Eaſt*, on a ſudden the *Wind* paſſing by the *North*, a *Nitrous* ſharp *North-Weſt* blows; not with High Guſts, but with a cutting Brisk Air; and thoſe Vales that ſeem then to be Shelter'd from the *Wind*, and lie Warm, where the Air is moſt Stagnant and Moiſt, are *Frozen* the Hardeſt, and ſeiz'd the Sooneſt, and there the *Fruits* are more ſubject to *Blaſt* than where the Air has a Free *Motion*. *Snow* falls ſometimes in pretty Quantity, but rarely Continues there above a Day or Two. Their *Spring* is about a Month Earlier than in *England*. In *April* they have frequent *Rains*, ſometimes ſeveral ſhort and ſudden Guſts. *May* and *June* the *Heat* Increaſes: and it is much like our *Summer*, being Mitigated with gentle *Breezes*, that Riſe about 9 of the *Clock*, and Decreaſe and Incline as the Sun Riſes and Falls. *July* and *Auguſt* thoſe *Breezes* Ceaſe, and the Air becomes Stagnant: ſo that the *Heat* is Violent and Troubleſome. In *September* the *Weather* uſually *Breaks* ſuddenly, and there falls generally very Conſiderable *Rains*. When the *Weather Breaks* many fall *Sick*; this being the Time of an *Epidemical Sickneß*, for *Seaſonings*, *Cachexies*, *Fluxes*, *Scorbutical Dropſies*, *Gripes*, or the like: which I have attributed to this Reaſon. That by the Extraordinary *Heat* the Ferment of the *Blood* being Raiſed too High, and the *Tone* of the *Stomach* Relax'd, when the *Weather Breaks*, the *Blood* Palls, and like Over-fermented Liquors is Depauperated, or Turns Eager and Sharp, and there's a *Crude Digeſtion*, whence the nam'd *Diſtempers* may be ſuppos'd to Enſue. And for Confirmation I have Obſerv'd the *Carminative Seeds*, ſuch as *Warm*, and whoſe *Oyl* ſheaths the *Acid* Humours that ever reſult from *Crude Digeſtions*; But *Decoctions* that Retain the *Tone* of the *Stomach*, as I ſuppoſe, by making the little *Glands* in the *Tunicles* of the *Stomach*, Squeeze out their *Juice*, (for what is *Bitter* may be as well Offenſive to the *Stomach* as to the *Palate*) and then *Chalibiates* that raiſe the decay'd Ferment, are no Bad Practice; after which, I conceive, *Ar-*

moniack

moniack Spirits might be very Beneficial. 'Tis wonderful to consider what Influence the *Air* has over Mens Bodies, whereof I had my self sad Assurances; for tho' I was in a very Close Warm Room, where was a Fire constantly kept, yet there was not the least Alteration or Change, whereof I was not Sensible when I was Sick of the *Gripes*. When a very Ingenious Gentlewoman was Visited with the same Distemper, I had the opportunity of making very considerable Observations. I stood at the Window and could view the Clouds Arise; For there small Black Fleeting Clouds would Arise, and be Swiftly carry'd cross the whole Element; and as these Clouds Arose, and came nigher, her Torments were Encreas'd, which were Grievous as a *Labouring Woman's*; there was not the Least *Cloud* but lamentably Affected her, and that at a considerable Distance; but by her Shrieks it seem'd More or Less, according to the Bigness and Nearness of the Clouds. The *Thunder* there is attended often with *Fatal Circumstances*: I was with my Lord *Howard* of *Effingham* the Governour, when they brought word that one Dr. *A.* was Kill'd therewith after this manner: He was *Smoaking* a *Pipe* of *Tobacco*, and looking out at his Window when he was struck *Dead*, and Immediately became so *Stiff*, that he did not fall, but stood Leaning in the *Window*, with the *Pipe* in his *Mouth* in the same *Posture* he was in when Struck: but this I only deliver as a Report, tho' I heard the same Account from several, without any Contradicting it. These things are Remarkable, that it generally Breaks in at the *Gable End* of the Houses, and often Kills Persons in, or near the *Chimney's Range*, darting most Fiercely down the *Funnel* of the *Chimney*, more especially it there be a *Fire*; I speak here confusedly of *Thunder* and *Lightning*, for when they Do any Mischief, the Crash and Lightning are at the same instant, which must be from the nearness of the Cloud. One time when the *Thunder* Split the Mast of a Boat at *James-Town*, I saw it Break from the Cloud, which it Divided into Two, and seem'd as if it had shot them immediately a *Mile* asunder, to the Eye. It is Dangerous, when it *Thunders*, standing in a Narrow Passage, where there's a Thorough Passage, or in a Room betwixt two Windows; tho' several have been Kill'd in the Open Fields. 'Tis Incredible to tell how 'twill Strike Large *Oaks*, Shatter and Shiver them, sometimes Twisting round a Tree, sometimes as if it Struck the Tree Backwards and Forwards. I had Noted a Fine Spreading *Oak* in *James-Town* Island, in the Morning I saw it Fair and Flourishing, in the Evening I observ'd all the *Bark* of the Body of the Tree, as if it had been artificially Peel'd off, was orderly Spread round the Tree in a Ring, whose Semi-Diameter was 4 *Yards*, the Tree in the Center; all the Body of the Tree was Shaken and Split, but its Boughs had all their Bark on; few Leaves were Fallen, and those on the Boughs as Fresh as in the Morning, but Gradually afterwards Wither'd, as on a Tree that is Fallen. I have seen several *Vast Oaks* and other *Timber-Trees*, Twisted as if it had been a small *Willow* that a Man had Twisted with his Hand, which I could suppose had been done by nothing but the *Thunder*. I have been told by very serious *Planters*, that 30 or 40 *Years* since, when the Country was not so Open, the *Thunder* was

more Fierce, and that ſometimes, after Violent *Thunder* and *Rain*, the Roads would ſeem to have a perfect caſt of *Brimſtone*; and 'tis Frequent after much *Thunder* and *Lightning* for the *Air* to have a perfect *Sulphureous Smell*. Durſt I offer my weak Reaſons, I might here conſider the *Nature* of *Thunder*, and *Compare* it with ſome *Sulphureous Spirits* which I have drawn from *Coals*, that I could no way *Condenſe*, yet were Inflammable; nay, would *Burn* after they paſs'd through the Water, and that ſeemingly Fiercer if they were not over-power'd therewith. I have kept of this *Spirit* a conſiderable time in Bladders; and tho' it appear'd as if they were only Blown with Air, yet, if I let it forth, and Fired it with a Match or Candle, it would continue Burning till all were Spent. An Obſervance of the *Meteors* there might perhaps not be impertinent, as both what are more Rare, and what are more Frequent, as of *Goſimore* in great Abundance, and of thoſe ſmall *Cobwebs* in a Morning, which ſome have ſuppos'd to be *Meteors*. *Ignes fatui*, tho' there be many Boggy *Swamps* and *Marſhes*, are ſeldom, if any are ſeen there.

There be Frequent little ſorts of *Whirl-Winds*, whoſe Diameter may be ſometimes not paſt 2 or 3 *Yards*, ſometimes 40. which Whisking Round in a Circle, paſs along the Earth, according to the Motion of the Cloud, from whence they Iſſue; and as they paſs along, with their *Gyrous* or *Circular Motion* they carry aloft the Dry Leaves into the Air, which fall again often in Places far Remote. I have ſeen them Deſcend in a Calm Sun-Shine Day, as if they had come from the Heavens in great Showers thereof, ſo that all the Elements ſeem'd Fill'd therewith: and I could perceive them to Deſcend from on High, as far as I could Poſſibly Diſcern a *Leaf*.

I thought this made it Manifeſt, whence many Preternatural Showers have Happen'd. I remember at Sir *Richard Atherton's* in *Lancaſhire*, ſome few *Years* ago, there fell a great Number of the *Seeds* of *Ivy-berries*; at firſt we admir'd what they were, for they were covered with a thin Skin that was Red, and Reſembled the Figure of a ſmall *Wheat Corn*; but afterwards they fully Manifeſted what they were; for many Sprouted and took Root: I ſuppoſe they were carried aloft by ſome ſuch *Whirl-Wind*, and let fall there. I have purpoſely gone into the Place where I perceived this *Guſt*, which is Notorious enough by the Noiſe it makes, with Ratling the Leaves as it carries them Aloft, and have found a fine Sharp *Breeze* of *Wind*.

Vid Vol. II. *Cap.* I. *Sect.* XL.

The Waters.

Betwixt the Two *Capes*, the Southern, call'd the *Cape Henry*, and the more Northerly call'd *Cape Charles*, there runs up a great *Bay*, call'd the *Bay* of *Cheeſepeak*; 9 *Leagues* over in ſome places, in moſt 7, Dividing *Virginia* into Two Unequal parts. On the *Eaſt* Side of this *Bay* there lies a Narrow Neck of Land which makes the Counties of *Northampton* and *Accomack*: On the *Weſt* ſide of the *Bay* there branches forth 4 Great *Rivers*, *James-River*, *York-River*, *Rapahanack* and *Potomack*.

The *Mouth* of *James-River*, which is the moſt Southerly of them, to the Mouth of *Potomack*, which is the moſt Northerly, may be 100 *Miles* Diſtance: But as I have been Credibly inform'd the *Falls* of *James-River* are not paſt 30 *Miles* from *Potomack*, which

is

is a vaſt Large River 9 *Miles* over in many places. I have been told it was *Navigable* nigh 200 *Miles*, much Higher than any of the other Rivers: Whence I conclude in Future Times, it will be the moſt Conſiderable for Trade, when the Country comes to be Inhabited further up into the Main Land. The other *Rivers* are much about 3 *Miles* over a piece: And *James-River* is *Navigable* at the leaſt 80 *Miles*. Within 4 or 5 *Miles* of *James-Town*, *James-River* and *York-River* are not paſt 4 or 5 *Miles* aſunder. Yea, Sloops of conſiderable Carriage may Sail up the Branches of the Two Rivers, till they come within a *Mile* the one of the other.

York-River is Diſtant from *Rapahanack* in ſome places not paſt 10 or 12 *Miles*, and *Rapahanack* from *Potomack* not paſt 7 *Miles* in One place, tho' it may be 60 in others. The *Heads* of the *Branches* of the Rivers interfere and Lock one within another: which I think is beſt expreſſed after the manner that an *Indian* explained himſelf once to me, when I enquired how nigh the *Rivers* of *Carolina*, *Virginia* and *Maryland* Aroſe out of the Mountains, from thoſe that ran *Weſterly* on the other ſide of the Mountains, he Clapt the Fingers of one Hand 'twixt thoſe of the other, crying, *They Meet thus*; The Branches of different Rivers Riſing not paſt 100 Paces one from the other: ſo that no Country in the World can be more curiouſly Watered. But this Conveniency at the Preſent I look on as the Greateſt Impediment to the Advance of the Country, and the greateſt Obſtacle to *Trade* and *Commerce*: For the great number of Rivers and the Thinneſs of the Inhabitants *Diſtract* and *Diſperſe* a *Trade*. So that all Ships in general gather each their Loading up and down an *Hundred Miles* Diſtant, and the beſt of *Trade* that can be Driven, is only a ſort of *Scotch Pedling*: for they muſt carry all ſorts of Truck that Trade thither, having one Commodity to paſs off another. This (*i. e.*) the *Number* of *Rivers*, is one of the Chief Reaſons why they have no *Towns*: For every one being more Solicitous for a Private Intereſt and Conveniency, than for a Publick, they will either be for making 40 *Towns* at once, that is 2 in every County, or none at all, which is the Country's Ruine.

The *Tides* in theſe *Rivers* regularly *Ebb* and *Flow* about 2 *Foot* perpendicular at *James-Town*; there is there as they call it, a *Tide* and *Half Tide*, that is, it *Flows* near 2 *Hours* along by the *Shoar*, after that it is *Ebb* in the *Channel*, and again it *Ebbs* near 2 *Hours* by the *Shore*, after that it is *Flood* in the *Channel*.

I ſuppoſe this is Cauſed by many *Creeks* and *Branches* of the *Rivers* which being conſiderably many, tho' only 3 or 4 *Miles* Long, yet as Broad as the *Thames* at *London*; others 10 *Miles* Long, ſome above 20 that have little *Freſh Water* which they carry of their own, but their *Current* Primarily depending upon the *Flux* and *Reflux* of the *Sea*. So that after the *Tide* is made in the *Channel*, it *Flows* by the *Shoar* a Conſiderable time, being that theſe *Creeks*, are ſtill to Fill, and therefore as it were Draws a Source upwards by the *Shoar*; and likewiſe when the *Tide* Returns in the *Channel*, the *Creeks* that could not ſo readily diſburſe their Water, being ſtill to Empty themſelves, they make an *Ebbing* by the *Shoar* a conſiderable time after that it is

Flood, as I ſay, in the *Channel*. So far as the *Salt-Waters* reach the Country is Deem'd leſs *Healthy*. In the *Freſhes* they more rarely are troubled with the *Seaſonings*, and thoſe *Endemical* Diſtempers about *September* and *October*. This being very Remarkable, it might perhaps be worthy the Diſquiſition of the moſt Learned to give an Account of the various Alterations and Fatal Effects that the *Air* has on Humane Bodies, eſpecially when impregnated with a *Marine Salt*; more peculiarly when ſuch an Air becomes Stagnant.

There is one thing more Remarkable in *Virginia*; Generally *Twice* in the *Year*, *Spring* and *Fall*. At certain *Spring-Tides*, the moſt of the Cattle will ſet on *Gadding*, and Run, tho' it be 20 or 30. *Miles*, to the *Rivers* to Drink the *Salt-Water*, at which time there's ſcarce any Stopping of them.

As for the *Waters* in the *Springs* in General, they are, I think ſomewhat more eager than thoſe in *England*; in that I have obſerved, they require ſome quantity more of *Malt* to make *Strong Beer* than our *Engliſh Waters*, and will not Bear *Soap*. I have tryed ſeveral by *Infuſing* of *Galls*, and found little Difference in the *Colours*, turning much what the *Colour* of Common *Sacks* in Taverns.

There's a *Spring* in the *Iſle of Wight* or *Nanzamond County* vents the greateſt *Source* of Water I ever ſaw, excepting *Holy Well* in *Wales*.

I could not Try any thing as to their *Specifick Gravity*, having neither *Aquapoiſe*, nor thoſe other Glaſſes I had contrived peculiarly for making ſuch Experiments, they being all loſt with my other things. I had Glaſſes blown would hold about 5 *Ounces*, others about 10 *Ounces*, with *Necks* ſo ſmall, that a Drop would make a conſiderable Variation; with theſe I could make much more Critical and Satisfactory Obſervations as to the *Specifical Gravity* of Liquors, having *Critical Scales*, than by any other way yet by me tried. I uſed this Method to *Weigh Urines*, which Practice I would recommend to the inquiſitive and critical Phyſicians: for there are more Signal Variations in the *Weights* of *Urines* than one would at firſt Imagine; and when the Eye can diſcover little, but judge Two *Urines* to be alike, they may be found to differ very much as to *Weight*. By *Weight* I find Obſervations may be made of *Affections* in the *Head*, which rarely make any Viſible *Alterations* in the *Urine*. I have found 2 *Urines* not much unlike, Differ 22 *Grains* in the Quantity of about 4 or 5 *Ounces*. But let them that make thoſe Eſſays *Weigh* all their *Urines* when *Cold*, leſt they be thereby Deceived. But to Return to the *Spring Waters* in *Virginia*. There's a *Spring* at my *Lady Berkley*'s, call'd *Green Spring*, (whereof I have been often told,) ſo very *Cold*, that 'tis Dangerous Drinking thereof in *Summer-Time*, it having proved of Fatal Conſequence to ſeveral.

There be many *Petrifying-Waters*; and indeed I believe few of the *Waters* but Participate of a *Petrifying Quality*, tho' there be few *Pebbles* or *Paving-Stones* to be found in all the Country. But I have found many Sticks with *Cruſty* Congelations round them in the Runs of *Springs*; and *Stones* Figured like Honey Combs, with many little *Stars* as it were ſhot in the Holes.

Mr.

Mr. Secretary *Spencer* has Told me of ſome Waters participating much of *Alome* or *Vitriol* towards *Potomack*: Up beyond the *Falls* of *Rapahanack* I have heard of *Poyſonous-Waters*.

When you make the *Capes* of *Virginia*, you may obſerve it *Low Land*, ſo that at ſome diſtance the Trees appear as if they grew in the Water; and as you approach nigher, to Emerge thence. For 100 *Miles* up into the Country, there are few *Stones* to be found, only in ſome Places *Rocks* of *Iron-Oar* appear. *The Earth and Soil n. 206. p. 94.*

In ſome places for ſeveral *Miles* together, the *Earth* is ſo Intermix'd with *Oyſter-Shells*, that there may ſeem as many *Shells* as *Earth*; and how deep they lie thus intermingled, I think, is not yet known; for at Broken Banks they diſcover themſelves to be continu'd many Yards perpendicular. In ſeveral places theſe *Shells* are much Cloſer, and being *Petrifyed*, ſeem to make a *Vein* of *Rock*. I have ſeen in ſeveral places, *Veins* of theſe *Rocky Shells*, three or four *Yards* thick, at the Foot of a Hill, whoſe Precipice might be 20 *Yards* Perpendicular, whoſe *Delf*, I ſuppoſe, ſhot under the Hill. Pieces of theſe *Rocks* Broken off, lie there, which, I ſuppoſe, may weigh 20 or 30 *Tuns* a-piece, and are as Difficult to be Broken as our *Free-Stone*. Of theſe *Rocks* of *Oyſter-Shells* that are not ſo much *Petrify'd*, they Burn and make all their *Lime*; whereof they have that ſtore, that no Generation will Conſume.

Often in the Looſer Binks of *Shells* and *Earth*, are found perfect *Teeth Petrify'd*, ſome whereof I have ſeen, could not be leſs than 2 or 3 *Inches* long, and above an *Inch* broad, tho' they were not *Maxillary Teeth*: the Part that one might ſuppoſe Grew out of the *Jaw*, was *Poliſh'd*, and *Black*, almoſt as *Jett*; the Part which had been Faſten'd in the *Jaw* and *Gums*, was *Brown*, and not ſo ſhiningly *Poliſh'd* or *Smooth*. If they were, as they ſeem'd to be, really *Teeth*, I ſuppoſe, they might have been of *Fiſhes*. The *Back-bone* of a *Whale*, and as I remember, they told me of ſome of the *Ribs*, were Digg'd out of the ſide of a Hill, ſeveral *Yards* Deep in the *Ground*, about 4 *Miles* diſtant from *James-Town* and the *River*. Mr. *Baniſter* a Gentleman pretty Curious in thoſe things, ſhew'd me likewiſe the *Joynt* of a *Whale's back-Bone*, and ſeveral *Teeth*, ſome whereof, he ſaid, were found in Hills beyond the *Falls* of *James-River*, at leaſt, 150 *Miles* up in the Country.

The *Soil* in General is *Sandy*. I had deſign'd, and I think it might be worth a Critical Remark, to obſerve the Difference of *Soils* ſeem Appropriated to the ſeveral *Sorts* of *Tobacco*: for there is not only the Two Diſtinct Sorts of a *Sweet-ſcented*, and *Aranoko-Tobacco*, but of each of theſe be ſeveral Sorts much Different, the *Seeds* whereof are known by Diſtinct Names, they having given them the Names of thoſe Gentlemen moſt Fam'd for ſuch ſort of *Tobacco*, as of *Prior-Seed*, &c. Nay, the ſame Sort of *Seed* in Different *Earths*, will Produce *Tobacco* much Different, as to Goodneſs. The Richer the Ground, the Better it is for *Aranoko-Tobacco*, whoſe *Scent* is not much Minded, their only Aim being to have it Specious, Large, and to procure it a Bright *Kite's Foot Colour*.

I conceive *Tobacco* to be a Plant abounding with *Nitro-Sulphureous* Particles; for the *Planters* Try the Goodneſs of their *Seed*, by caſting a little thereof into the *Fire*; if it be Good it will *Sparkle* after the manner of *Gun-powder*: ſo will the *Stalks* of *Tobacco Leaves*, and perhaps has ſomething Analogous to the *Narcotick Sulphur* of *Venus*, which the *Chymiſts* ſo Induſtriouſly Labour after. The World knows little of the Efficacy of its *Oyl*, which has Wonderfull Effects in the *Curing* of *Old Inveterate Sores*, and *Scrophulous Swellings*, and ſome, otherwiſe apply'd and Qualify'd. The Goodneſs of *Tobacco* I look on primarily conſiſts in the *Volatility* of its *Nitre*: and hence the *Sandy Grounds* that are moſt Impregnated therewith, and whoſe *Nitrous Salt* is moſt *Volatile*, for ſuch Grounds are quickſt Spent, yield *Tobacco*'s that have the Richeſt *Scent*, and that ſhortly becomes a *Pleaſant Smoak*; whereas, in *Tobacco* that Grows on *Stiff-Ground*, the *Salts* ſeem more *Fix'd*, and Lock'd up in the *Oyl*, ſo that whilſt New, 'tis very Heady, and Strong, and requires ſome Time for its *Salts* to Free themſelves, and become *Volatile*; which it Manifeſts by its having an *Urinous Smell*. The ſame Reaſon Satisfies, why *Tobacco* that grows on *Low-Lands*, as far as the *Salts*, tho' the Plant be never Over-flow'd with *Salt-Water*, yet the Ground that Feeds the Plant being Impregnated with *Salt-water*, that *Tobacco Smoaks* not Pleaſantly, and will ſcarcely Keep Fire, but do all that a Man can, will oft go out, 'till after it has been Kept ſome Conſiderable Time; which may be aſſign'd to the more *Fixed Saline* Particles of the *Marine Salt* in theſe Plants, which require more time e're they be rendred *Volatile*. I have obſerv'd, that that which is call'd *Pine-Wood-Land*, tho' it be a *Sandy-Soil*, even the *Sweet-Scented Tobacco* that grows thereon, being Large and Porous, agreeable to *Aranoko Tobacco*, *Smoaks* as Courſly as *Aranoko*: wherefore 'tis, that I believe the *Microſcope* might make notable Diſcoveries towards the Knowledge of *Good Tobacco*: for the Cloſer the Compoſition of the *Leaf*, the *Better* the *Tobacco*; and therefore the Planters and Merchants brag of the Subſtance of their *Tobacco*; which Word, did they always take it in a True Senſe, for the *Solidneſs*, and not miſtake it for the *Thickneſs*, it would be more conſonant to a true Obſervation: for as I ſaid of the *Pine-Wood Tobacco*, ſome of it is *Thick* and not *Solid*, and differs from the Beſt *Tobacco*, as *Buff* does from *Tann'd Leather*; ſo that if the *Tobacco* be Sound and not Rotten, you may give a great Gueſs at the *Goodneſs* of *Tobacco*, when you *Weigh* the *Hogſheads*, before you See them: for if an Equal Care be taken in the Packing of them, the *Beſt Tobacco* will *Weigh* the *Heavieſt*, and *Pack* the Cloſeſt. Now I ſaid, that the *Sweet-Scented-Tobacco* moſt in Vogue, which was moſt Fam'd for its *Scent*, was that that Grew on *Sandy Land*; which is True, if you would *Smoak* it whilſt *New*, or whilſt only 2 or 3 *Years* Old; but if you keep the *Stiff-Land-Tobacco*, which is generally a *Tobacco* of great Subſtance 5 or 6 *Years* it will much Excell: for tho' the *Sandy-Land-Tobacco* abound with a *Volatile Nitre* at firſt, yet the *Stiff-Land-Tobacco* abounds with a Greater Quantity of *Nitre*, only that it is Lock'd up in its *Oyl* at Firſt, and requires more Time to Extricate it ſelf, and become *Volatile*; but the *Pine-Wood-Land* having little of the *Nitro-Sulphureous*

tro-Salphureous Particles, neither is, nor ever will make any thing of a *Rich Smoak*. Diſcourſing hereof ſome Days ſince, to a Gentleman of good Obſervation, that has been Vers'd with *Maulting*, he aſſur'd me to back this my Suppoſition, or *Hypotheſis*, he had obſerv'd, That *Barly* that Grew on *Stiff-Ground*, requir'd more Time conſiderably to Mellow and come to Perfection, than that that Grew on *Light Land*. Having proceeded thus far to ſpeak of *Tobacco*, I ſhall Add one or two things more. The Planters Differ in their Judgments, about the *Time* of *Planting*, or *Pitching* their *Crops*: ſome are for *Pitching* their *Crops* very Early, others Late, without any Diſtinction of the Nature of the *Soils*; and 'tis from the Different Effects that they find in that, that ſometimes the Early, ſometimes the Late *Planting* Succeeds: but they have not the Reaſon to judge of the Cauſe, to conſider the Accidents of the Year, and the Difference of the *Soils*. In *Sandy Grounds* they need not Strive ſo much for *Early Planting*, the Looſeneſs of the Earth, and the Kind natur'd Soil, yielding all that it can, Eaſily and Speedily, and *Sand* retaining the *Heat*, makes the *Plants* Grow faſter. But in *Stiff-Soils*, if the *Crops* be not *Early Pitch'd*, ſo that during the Seaſon of *Rains* it have got conſiderable Roots, and ſhot them ſome Depth, if Early *Droughts* come, it ſo Binds the Land, that the Roots never Spread nor Shoot Deeper or Further than the *Hills* that they are *Planted* in. Obſerving this on the *Plantation* where I Liv'd, that it was *Stiff-Ground*, I adviſ'd them to *Plant* their *Crops* as *Early* as poſſible: and in order thereunto, I try'd ſeveral ways to further the *Plants*; and what I found moſt Advantagious, was, by taking an *Infuſion* of *Horſe-Dung*, and putting thereon *Soot*, and then my *Seeds*; this I kept 48 *Hours* in an ordinary *Digeſtive Heat*. When I *Sow'd*, I mix'd *Aſhes* with the *Seed* (having Decanted the Liquor,) that the *Seed* might *Sow* the Evener: the Effect was, that my *Plants* came up Sooner, Grew Swifter, and I had 5 *Plants* for *one*, more than any of the other *Beds* round about mine.

There be various *Accidents* and *Diſtempers*, whereunto *Tobacco* is liable; as the *Worm*, the *Fly*, *Firing to Turn*, as they call them, *French-men*, and the like. I propos'd ſeveral ways to *Kill* the *Worm* and *Fly*, as by *Sulphur*, and the like; but had no opportunity to Experiment it: I ſhall ſet down that I had moſt hopes of, which perhaps may give a Hint to others to Try or Improve. *Tobacco-Seed* is very Small, and by conſequence ſo is the *Young Plant* at firſt, and if Gleamy Weather happen at that time, it breeds a Small *Fly*, which conſumes the *Plume* of the *Plant*; now it being Early in the *Year* when they *Sow* the Seed, *viz.* about the 14*th* of *January*, they Cover the Ground to ſecure, as well as they can their *Tender Plants*, from the Nipping *Froſts*, that may happen in the Nights; they Cover them only with a few *Oak-Leaves* or the like; for *Straw* they find apt to Harbour or Breed this *Flie*. I therefore would Adviſe them to *Smoak Straw* with *Brimſtone*, once in 2 or 3 Nights, and ſo they might cover them ſecurely, with that which would Preſerve them infinitely beyond the Covering with *Oak-Boughs*; indeed, I would Adviſe them to keep peculiarly ſo much of their *Indian-Corn-Blades*, which they gather for their

Fodder,

Fodder, for this very purpoſe, being, as I conceive much the beſt, there being no Chaff to foul their Beds, and prejudice them when they ſhould *Weed* them.

What they call *Firing* is this: When *Plants* are of ſmall Subſtance, as when there has been a Wet and very Cold Seaſon, and very Hot Weather ſuddenly enſues, the *Leaves* turn *Brown*, and Dry to Duſt; the Cauſe I conceive to be hence: The *Plant* being Feeble, and having a ſmall Quantity of *Oil*, which makes the more *Solid* Part of the Plant, the *Earth* being ſuddenly Heated by the Sun's Fiercer Beams, the Roots are rather ſcorched and Dried up in the *Earth*, than Nouriſhed; ſo that the *Plant* conſiſting only of *Watry* parts, is Conſumed, as it were, by Fire: ſometimes Hopeful Plants, when by a ſudden Guſt ſome *Maſter Veins* are Broken, if ſudden Heat enſues they likewiſe *Fire*: for being not come to Maturity, and being Deprived of the Supports of *Life* and *Vegetation*, they likewiſe Periſh, are Dried up and fall to Duſt.

French-men they Call thoſe *Plants*, whoſe *Leaves* do not ſpread and grow large, but rather Spire upwards, and grow Tall; theſe *Plants* they do not Tend, being not worthy their Labour. Were they ſo Critical, I believe they might have great Gueſs what Plants were moſt likely to turn *French-men*, by obſerving whether the *Roots* of the *Plants* run Downwards, as thoſe whoſe Branches are apteſt to Spire Upwards: for tho' I have not made poſitive proof thereof, I have ſomething more than bare fancy for my Conjecture; I have pull'd up ſome of theſe *French-men*, and compared them with the Roots of ſome other *Plants*, and found them much Longer than others; and 'tis Obſervable, *Looſe Soyls*, and *Sandy Ground*, are more ſubject thereto than the *Stiff-Land*.

The Country of it ſelf is one Entire *Wood* conſiſting of large *Timber Trees* of ſeveral ſorts, Free from *Thickets* or *Under-Wood*; the ſmall *Shrubs* growing only on Lands that have been Clear'd, or in *Swamps*; and thus it is for ſeveral *Hundreds* of *Miles*, even as Far as has yet been *Diſcover'd*.

n. 206. p. 978. As to the River on the other ſide the Mountains, ſaid to *Ebb* and *Flow*, I have been aſſur'd by Col. *Bird*, who is one of the Intelligenteſt Gentlemen in all *Virginia*, and knows more of *Indian* Affairs than any Man in the Country, that it was a Miſtake; for that it muſt run into a *Lake* of *Freſh Water* to which the *French* have given the Name of *Lake Petite*, there being ſeveral Larger *Lakes* 'twixt that and *Canada*. The *French* Poſſeſſing themſelves of theſe *Lakes*, no doubt will in ſhort time be abſolute Maſters of the *Beaver Trade*; the greateſt Numbers of *Beavers* being Catched there.

But to return to the Parts of *Virginia* inhabited by the *Engliſh*, which in general is a very Fertile *Soil*, far ſurpaſſing *England*, for there *Engliſh Wheat* (as they call it, to diſtinguiſh it from *Maze*, commonly call'd *Virginia Wheat*) yields generally 'twixt 15 and 30 *Fold*, the Ground only once Plowed; whereas 'tis a good Crop in *England* that yields above 8 *Fold*, after all their Toil and Labour. And yet in truth it is only the *Barenneſt* Parts that they have Cultivated, *Tilling* and *Planting* only the *High-Lands* leaving the Richer *Vales* unſtirr'd, becauſe they underſtand not any thing

of

of *Draining*. So that the Richeſt *Meadow Lands*, which is one third of the Country, is *Boggy*, *Marſh*, and *Swamp*, whereof they make little Advantage, but looſe in them abundance of their Cattle, eſpecially at the firſt of the *Spring*, when the *Cattle* are Weak, and venture too far after young Graſs. Whereas vaſt Improvements might be made thereof; for the generality of *Virginia* is a *Sandy Land* with a *Shallow Soil*. So that after they have cleared a freſh piece of Ground out of the *Woods* it will not bear *Tobacco* paſt 2 or 3 *Years*, unleſs *Cow-pen'd*; for they *Manure* their Ground by keeping their Cattle, as in the South you do your Sheep, every Night confining them within Hurdles, which they remove when they have ſufficiently *Dung'd* One Spot of Ground. But alaſs! They cannot Improve much thus: beſides it produces a ſtrong ſort of *Tobacco*, in which the *Smoakers* ſay they can plainly Taſte the Fulſomeneſs of the *Dung*. Therefore every 3 or 4 *Years* they muſt be for *Clearing* a new piece of *Ground* out of the *Woods*, which requires much Labour and Toil, it being ſo Thick grown all over with Maſſy Timber. Thus their *Plantations* run over vaſt Tracts of Ground each Ambitioning to engroſs as much as they can, that they may be ſure to have enough to *Plant*, and for their Flocks and Herds of *Cattle* to Range and Feed in: ſo that *Plantations* of 1000, 2000, or 3000 *Acres* are Common; whereby the Country is Thinly Inhabited; their Living Solitary and Unſociable; Trading Confuſed and Diſperſed; beſides other Inconveniencies. Whereas they might Improve 200 or 300 *Acres* to more advantage, and would make the Country much more Healthy; for thoſe that have 3000 *Acres* have ſcarce *Cleared* 600 *Acres* thereof, which is peculiarly termed the *Plantation*, being ſurrounded with the 2400 *Acres* of *Woods*; ſo that there can be no free or even Motion of the *Air*, but the *Air* is kept either *Staguant*, or the Lofty *Sulphureous* Particles of the Air, that are Higher than the Tops of the Trees, which are above as High again as the generality of the *Woods* in *England*, Deſcending when they paſs over the *Cleared* Spots of Ground, muſt needs in the *violent Heat* of Summer, raiſe a Preternatural Ferment, and produce Bad Effects. Nor is it any Advantage to their Stocks or Crops; for did they but *Drain* their *Swamps* and *Low-Lands*, they have a very Deep Soil, that would endure *Planting* 20 or 30 *Years*; and ſome would ſcarce ever be worn out, but be ever Longer Better, for they might lay them all Winter, or when they pleaſed, in Water, and the Product of their Labour would be Double or Treble, whether *Corn* or *Tobacco*.

On the *Plantation* where I Lived, I Drain'd a good large *Swamp*, which fully anſwered Expectation, for with 3 Men in 13 Days I *Drained* the whole *Swamp*, and it being *Sandy Land*, Soaks and Drains admirably well, and what I little expected, I laid a *Well* Dry at a conſiderable diſtance. The Gentlewoman, who was Owner of that *Plantation* was in *England* laſt Year, and I think Dr. *Moulin* was by when ſhe asked me, Now to teach her how ſhe might make her *Tobacco* that grew in that *Swamp* leſs, for it produced ſo very Large, that it was ſuſpected to be of the *Aranoko kind*: I

told her tho' the Complaint was Rare, yet there was an Excellent Remedy for that, in letting every *Plant* bear 8 or 9 *Leaves* instead of 4 or 5 and she would have More *Tobacco*, and Less *Leaves*.

There are many other Places as easie to *Drain* as this, tho' of larger Extent and Richer *Soil*: Even in *James-Town Island*, which is much what of an Oval Figure, there's a *Swamp* runs Diagonalwise over the Island, whereby is lost at least 150 *Acres* of Land, which would be *Meadow*, and would turn to as good account as if it were in *England*: Besides it's the great Annoyance of the Town, and no doubt but it makes it much more *Unhealthy*. If therefore they but Scour'd the *Channel*, and made a pretty Ordinary Trench all along the Middle of the *Swamp*, Placed a *Sluice* at the Mouth where it Opens into the Back *Creek*; for the Mouth of the *Channel* there is Narrow, has a good Hard Bottom, and is not past 2 *Yards* Deep when the *Flood* is Out; as if Nature had design'd it before Hand: They might thus *Drain* all the *Swamp* absolutely Dry, or Lay it Under Water, at their pleasure.

And now since we are speaking of *James-Town*, give me leave to adjoyn some Reflections as to the *Situation* and *Fortifications* of the Place. *James-Town-Island* is rather a *Peninsula*, being joyned to the *Continent* by a small Neck of Land, not past 20 or 30 Yards over, and which at *Spring-Tides* is Overflowed, and is then an Absolute *Island*. Now they have built a silly sort of a *Fort*, that is, a Brick-Wall in the Shape of a *Half Moon*, at the beginning of the *Swamp*, because the *Channel* of the *River* lies very nigh the Shoar: but it is the same as if a *Fort* were Built at *Chelsey* to secure *London* from being taken by Shipping. Besides Ships passing up the *River* are secured from the *Guns* of the *Fort*, till they come directly over against the *Fort*, by reason the *Fort* stands in a *Vale*, and all the *Guns* directed down the *River*, that should Play on the Ships, as they are coming up the River, will Lodge their Shot within 10, 20, or 40 *Yards*, in a Rising Bank, which is much above the Level of the *Fort*; so that if a Ship gave but a good Broad Side, just when she comes to bear upon the *Fort*, she might put the *Fort* into that Confusion, as to have free Passage enough.

But if they would Build a *Fort* for the Security of the Town and Country, I conceive it should be on *Archer's-Hope-Point*, for that would Stop the Ships from passing up the *River*, before they came to the Town, and would Secure the Town from being Block'd up by Sea. The *Channel* at *Archer's-Hope-Point* lies close by the Shoar, and makes such an Angle there by reason of *Hog-Island*, that going up or down the *River*, let the Wind be where it will, they must there bring the Contrary *Tack* on *Board*, and generally when they *About the Ship*, as they call it, they are so nigh the Shoar, that a Man may almost fling a Finger Stone on Board. How much this Hinders the Motion of a Ship, and what Confusion it must be to them to bring a Contrary *Tack* on *Board* whilst they have all the *Guns* of a *Fort* playing so nigh upon them, may readily be Conceived. *Archer's Hope* is a Neck of Land that runs down 3 *Miles* long, not much past *half* a *Mile* Broad, betwixt the *Main River* and *Archer's-Hope-Creek*, which has large

Marshes

Marſhes and *Swamps*; ſo that a *Citadel* Built upon the *Point*, would almoſt be Impregnable, being it could be Attack'd no way but one, which is ſo Narrow a Slender Neck of Land, that it would be difficult to Take it that way: And it would ſecure *James-Town* from being *Blocked*, being it would not be paſt a *Mile* by Water, to the Point of *James-Town-Iſland*: and the *Iſland* is ſo ſurrounded with Water and *Marſhy* Land, that the Town could never be Bomb'd by Land.

But now to Return to the Reflections of *Improving*, and *Manuring* of Land in *Virginia*; hitherto, as I have ſaid, they have uſed none but that of *Cow-Penning*; yet I ſuppoſe they might find very good *Marle* in many places: I have ſeen both the *Red* and *Blew-Marle* at ſome Breaks of Hills. This would be the Propereſt *Manure* for their *Sandy Land*, if they ſpread it not too Thick, theirs being, as I have ſaid, a *Shallow Sandy Soil*: which was the Reaſon I never advis'd any to uſe *Lime*, tho' they have very good *Lime* of *Oyſter-Shells*; but that's the propereſt *Manure* for *Cold Clay Land*, and not for a *Sandy Soil*. But as moſt Lands have one *Swamp* or another bordering on them, they may certainly get Admirable *Slitch*, wherewith to *Manure* all their *Up-Lands*. But this, ſay they, will not *Improve* Ground, but Clods and Grows Hard. 'Tis true, it will do ſo for ſome Time, a *Year* or *Two* at the firſt: but did they caſt it in *Heaps*, and let it lie for 2 or 3 *Years*, after a *Froſt* or *Two* had ſeiz'd it, and it had been well Pierc'd therewith, I doubt not it would turn to good Account. And for this, I have ſomething more than bare Conjecture; for Diſcourſing it once with a good Notable *Planter*, we went to view a *Heap* thereof that caſually he had caſt up 'twixt 3 or 4 *Years* before, and we found it not very Binding, but rather a Fine Natural *Mould*: whereupon he did Confeſs, he then Remember'd that out of a Ridge of the like *Mould*, he had had very Large *Plants*, which muſt have been of the like *Slime* or *Slitch* caſt up before. But he ſaid, that himſelf and others Deſpair'd of this *Manure*, becauſe they had taken of this *Slitch* Freſh and Moiſt out of the *Swamp*, and fill'd *Tobacco-Hills* with it, and in the midſt of it *Planted* their *Plants*: which ſo bound the Roots of their *Plants*, that they never came to any thing.

They neither *Houſe* nor *Milk* any of their Cows in Winter, having a Notion that it would Kill them: yet I perſwaded the Lady where I Liv'd, to *Milk* 4 *Cows* the laſt Winter that I ſtay'd in the Country, whereof ſhe found ſo good Effect, that ſhe aſſur'd me ſhe would keep to my Advice for the Future; and alſo, as I had further Urg'd, *Houſe* them too, for which they have mighty Conveniencies, their *Tobacco-Houſes* being Empty ever at that Time of the Year, and may eaſily be fitt'd in 2 or 3 Days time without any Prejudice, whereby their Cattel would be much Shelter'd from thoſe Pinching Sharp *Froſts* that ſome Nights on a Sudden become very Severe. I had another Project for the Preſervation of their Cattel prov'd very Succeſsfull; I urg'd the Lady to Sow her *Wheat* as Early as poſſibly ſhe could, ſo that before *Winter* it might be well Rooted, to be Early and Flouriſhing at the firſt of the *Spring*: So that ſhe might turn thereon her Weak Cattel, and ſuch as ſhould at any time be *Swamp'd*, whereby they

might be Recruited and Sav'd, and it would do the *Wheat* good alſo. I adviſ'd her likewiſe to Save and carefully gather the *Indian-Corn* Tops and Blades, and all her Straw, and whatſoever could be made *Fodder*, for her Cattel: for they get no *Hay*, (tho' I was Urging her to that too, and to Sow *Saintfoin*; for being a *Sandy Soil*, I am Confident it would turn to a very good Account,) and little *Fodder*, but as they think *Corn* being more Nouriſhing, Feed them with their *Indian Corn*, which they give them Morning and Evening. Thus they ſpend a great Quantity of *Corn*, and when all's done, what ſignifies 2 or 3 Heads of *Corn* to a Beaſt in a Morning? It only makes them Linger about the Houſes for more: and after ſuch Sweet-Food they are not ſo apt to Brouze on the Trees, and the Courſe Graſs which the Country affords; ſo that their *Guts* ſhrink up, and they become *Belly-ſhot*, as they call it. I adviſed therefore never to give them any thing in a Morning, whereby as ſoon as they were ſet forth of the *Cow-pens*, they would fall a Feeding, and tho' they fill'd their Bellies only with ſuch courſe Stuff as had little Nouriſhment in it, yet it would Keep Out their Bellies, and they would have a better *Digeſtion*; and then when they were come home at Night, to *Fodder* them, beginning with *Straw* and their *Courſeſt Fodder*, which they would learn to Eat by Degrees, before they Taſted that that was more Delicate, and whilſt their *Digeſtion* was Strong, would yield them *Nouriſhment* to keep them ſtill ſo: afterward, when the *Winter* Pinch'd, their Fine Fodder then would ſtand them in ſtead; and hereby they might preſerve their Weakeſt Cattle, by theſe Methods and help of the *Wheat-patch*. She, (the Gentlewoman where I liv'd,) ſav'd all her Cattel, and loſt not one in 2 *Winters* after, that I ſtay'd there; beſides ſhe ſav'd above 20 *Barrels* of *Corn*, and a *Barrel* of *Corn*, is commonly worth 10 *Shillings*. Nay further, The laſt *Spring* ſhe *Fed* 2 Beaſts, a Bullock and a Cow, *Fat* upon her *Wheat*, with the Addition only of a little *Boil'd Corn*, and yet the *Wheat* was ſcarce Eat down enough.

But to return again to the *Nature* of the *Earth*. I have obſerv'd, that at 5 or 6 *Yards* Deep, at the Breaks of ſome Banks, I have found *Veins* of *Clay*, admirable good to make *Pots*, *Pipes*, or the like: and whereof I ſuppoſe the *Indians* make their *Pipes*, and *Pots* to Boil their Meat in, which they make very Handſomely, and which will endure the *Fire* much better than moſt *Crucibles*. I took of this *Clay*, Dry'd, Powder'd, and Sifted, Powder'd and Sifted *Potſheards*; and *Glaß*; 3 parts, 2 parts, and one part, as I remember; and therewith made a large *Crucible*, which was the beſt I yet ever try'd in my Life: I took it once *Red-Hot* out of the *Fire*, and clapt it immediately into the Water, and it ſtarted not at all. The Country abounds mightily with *Iron-Ore*, that as I have been aſſur'd by ſome upon Tryal, has been found very good. There are Rocks thereof appear at the Precipice of Hills, at the Foot whereof there runs a River fit for a *Forge*, and there's *Wood* enough to ſupply it with *Charcoal*. As I have heard, there were formerly ſome Perſons undertook the Work, and when they had made but a ſmall Quantity of *Iron*, which prov'd very Good, the *Indian Maſſacre* happen'd, and they being Higher ſeated than the then Inhabited

part of the Country, were all Cut off, and the *Works* Demoliſh'd. Some *Indians* brought Coll. *Bird* ſome *Black-Lead*, whereof he has told me there is great ſtore. There's very curious *Talk* towards the *Falls* of *Rapahanock River*, which they *Burn*, and make a Delicate *White Waſh* of it. The Secretary of State, Coll. *Spencer*, has aſſur'd me, there were *Vitriolick* or *Aluminous Earths* on the Banks of *Potomack*.

There are 3 ſorts of *Eagles*; The Largeſt I take to be that they call the *Grey-Eagle*, being much of the Colour of our *Kite* or *Glead*. The *Second* is the *Bald-Eagle*, for the Body and part of the Neck being of a *Dark-Brown*, the Upper-part of the Neck and *Head* is cover'd with a *White* ſort of *Down*, where it looks very *Bald*, whence it is ſo Nam'd. The 3*d* ſort is the *Black-Eagle*, reſembling moſt the *Engliſh Eagle*: they Build their Neſts much after the manner that Dr. *Willoughby* deſcribes, and generally at the Top of ſome Tall Old Tree, naked of Boughs and nigh the River ſide, and the People fell the Tree generally when they take the Young. They are moſt frequently ſitting on ſome Tall Tree by the River ſide, whence they may have a Proſpect Up and Down the River, as I ſuppoſe, to obſerve the *Fiſhing-Hawks*; for when they ſee the *Fiſhing-Hawk* has ſtruck a *Fiſh*, immediateiy they *Take Wing* and 'tis ſometimes very pleaſant to behold the Fight, for when the *Fiſhing-Hawk* perceives her ſelf purſued, ſhe will Scream and make a Terrible Noiſe, till at length ſhe let fall the *Fiſh* to make her own eſcape, which the *Eagle* frequently catches before it reach the Earth or Water. Theſe *Eagles* kill Young *Lambs*, *Pigs*, &c. *The Birds. Vol.* P. 988.

The *Fiſhing-Hawk* is an abſolute Species of a *King's Fiſher*, but full as Large, or Larger than our *Jay*; much of the Colour and Shape of a *King's Fiſher*, tho' not altogether ſo curiouſly Feather'd; it has a Large Crop, as I remember, there is a little *King's Fiſher* much the ſame, in every reſpect with ours.

If I miſtake not, I have ſeen both the *Goſs-Hawk*, and *Falcon*; beſides there are ſeveral ſorts of the Leſſer Kind of *Stannels*.

There is likewiſe the *Kite* and the *Ringtail*.

There's both a *Brown-Owl* and a *White Owl*, much what as large as a *Gooſe*, which often Kills their *Hens* and *Poultry* in the Night. The *White-Owl* is a very Delicately Feather'd Bird; all the Feathers upon her Breaſt and Back being *Snow-White* and Tipp'd with a Punctal of *Jet-Black*. Beſides, there is a *Barn-Owl* much like ours; and a little ſort of *Scritch-Owl*.

There's both the *Raven* and *Carrion-Crow*.

The Night-Raven which ſome call the *Virginian Bat*, is about the Bigneſs of a *Cuckow*, *Feather'd* like them but very ſhort, and ſhort Legg'd not Diſcernable when it Flies; which is only in the Evening, Scudding like our *Night-Raven*.

There's a Great ſort of *Ravenous Bird* that feed upon *Carrion*, as big very nigh as an *Eagle*, which they call a *Turky-Buſtard*, its Feathers are of a *Duskiſh-Black*, it has *Red Gills*, reſembling thoſe of a *Turky*, whence it has its Name; it is nothing of the ſame ſort of *Bird* with our *Engliſh Turky-Buſtard*,

Eastard, but it is rather a Species of the *Kites*, for it will Hovers on the Wing ſomething like them, and is *Carnivorous*. The *Fat* thereof diſſolved into an *Oil*, is recommended mightily againſt *Old Aches* and *Sciatica Pains*.

The *Pica Glandaria*, or *Jay*, is much leſs than our *Engliſh Jay*, and of another Colour: For it is all *Blue* where ours is *Brown*; the Wings *Marbled* as curiouſly as ours are; it has both the ſame *Cry*, and ſudden Jetting Motion.

There are great Variety and Curioſity in the *Wood-peckers*; there's one as big as our *Magpye*, with *Blackiſh Brown* Feathers, and a Large *Scarlet Tuft* on the Top of the Head. There are 4 or 5 ſorts of *Wood-peckers* more, Variegated with *Green*, *Yellow* and *Red Heads*; others Spotted *Black* and *White*, moſt lovely to behold: There's a Tradition amongſt them, That the *Tongue* of one of theſe *Wood-peckers* Dry'd will make the *Teeth* Drop out if Pick'd therewith, and Cure the *Tooth-Ach*.

There be *Wild-Turkeys* extream Large; they talk of *Turkies* that have been kill'd, that have Weighed betwixt 50 and 60 *Pound* weight; the Largeſt that ever I ſaw, weighed ſomething better than 38 *Pound*. They have very Long Legs, and will run prodigiouſly faſt: I remember not that ever I ſaw any of them on the Wing, except it were once. Their *Feathers* are of a *Blackiſh ſhining Colour*, that in the Sunſhine like a *Dove's Neck*, are very Specious.

Hens and *Cocks* are for the moſt part without *Tails* and *Rumps*: and as ſome have aſſured me our *Engliſh Hens*, after ſome time being kept there, have their *Rumps* Rot off; which I am the apter to believe, being all their *Hens* are certainly of *Engliſh Breed*. I'm ſorry I made no *Anatomical* Obſervations thereof, and Remarks about the Uſe of the *Rumps* in *Birds*, which at preſent I take to be a couple of *Glands*, containing a ſort of Juice for the Varniſhing of the Feathers; having obſerved all *Birds* have much recourſe with their *Bills* to the *Rumps* when they *Dreſs* their *Plumes*, whereby they Scud through the Air more Nimbly in their Flight.

Partridges there are much Smaller than ours, and reſort in *Covies* as ours do; their Fleſh is very White, and much excells ours in my Mind: *Sed de* Guſtibus *non eſt diſputandum*.

Their *Turtle-Doves* are of a *Duskiſh-Blew-Colour*, much leſs than our Common *Pigeons*, the whole *Train* is longer much than the *Tails* of our *Pigeons*, the *Middle Feather* being the Longeſt. There's a ſtrange Story of a vaſt Number of theſe *Pigeons*, that came in a Flock a few *Years* before I came thither; they ſay, they came through *New-England*, *New-York* and *Virginia*, and were ſo Prodigious in Number as to Darken the Sky for ſeveral Hours in the Place over which they Flew, and Brake Maſſie Boughs where they Lighted; and many like things which I have had aſſerted to me by many Eye-Witneſſes of Credit, that to me it was without doubt, the Relators being very Sober Perſons, and agreeing in the Story: nothing of the like ever happened ſince; nor did I ever ſee paſt 10 in a Flock together that I remember.

The

The *Thruſh* and *Feldefare* are much like Ours, and are only ſeen in *Winter* There, accordingly as they are Here.

Their *Mocking-Birds* may be compared to our *Singing Thruſhes*, being much of the ſame Bigneſs. There are 2 ſorts, the *Gray* and the *Red*: the *Gray* has Feathers much of the Colour of our *Grey Plovers*, with *White* in the *Wings* like a *Magpye*; this has the much *Softer Note*, and will Imitate in its *Singing*, the *Notes* of *All Birds* that it hears, and is accounted much the Fineſt *Singing Bird* in the World.

This *Mocking Bird* having its Name from *Mimicking* all other Birds in *Singing*, is a Wonderful Mettled Bird, Bold and Brisk, and yet ſeems to be of a very Tender Conſtitution, neither *Singing* in *Winter*, nor in the midſt of *Summer*, and with much Difficulty are any of them brought to Live in *England*.

The *Red Mocking Bird* is of a *Duskiſh-Red*, or rather *Brown*: it *Sings* very well, but has not ſo *Soft a Note* as the *Gray-Mocking Bird*.

Of *Virginia-Nightingale*, or *Red-Bird*, there are 2 ſorts; the *Cocks* of both ſorts are of a Pure *Scarlet*, the *Hens* of a *Duskiſh Red*. I diſtinguiſh them into 2 ſorts; for the one has a *Tufted Cops* on the Head, the other is *Smooth-Feather'd*, I never ſaw a *Tufted-Cock* with a *Smooth-Headed-Hen*, or on the contrary; they generally Reſorting a *Cock* and *Hen* together, and Play in a Thicket of Thorns or Briars in the Winter, nigh to which the Boys ſet their Traps, and ſo Catch them and ſell them to the Merchants for about 6 *Pence* a-piece, by whom they are brought for *England*; they are ſomething leſs than a *Thruſh*.

There's a Bird very Injurious to *Corn*, they call a *Black-Bird*; I look on it to be a ſort of *Starling*, for they Cry ſomething like them but do not *Sing*, much what of the ſame Bigneſs, have Fleſh *Blackiſh* like theirs; they Reſort in great Flocks together; they are as *Black* as a *Crow* all over, their Bills and all, only ſome of them have *Scarlet* Feathers in the *Pinions* of their *Wings*.

They have a *Lark* nothing differing from our Common *Lark*; they have another Bird which they Call a *Lark* that is much Larger, as big as a *Starling*; it has a *Soft Note*, Feeds on the Ground, and as I remember has the Specifical Character of a *Long Heel*, it is more enclin'd to *Yellow*, and has a Large *Half-Moon* on it's *Breaſt* of *Yellow*.

They have a *Martin* very Like, only Larger than Ours, that Builds after the ſame manner. The Honourable Col. *Bacon* has Remarked for ſeveral *Years*, that they conſtantly Come thither upon the 10*th*. of *March*, one or two of them appearing before, being ſeen Hovering in the Air for a Day or two, then Go away, and as he ſuppoſed Returned with the Great Flock. The Colonel delighted much in this *Bird*, and made *Holes* like *Pigeon-Holes* at the End of his Houſe with Boards purpoſely for them.

Their *Swallow* differs but little from Ours.

They have a Bird they call a *Blew-Bird*, of a Curious *Azure* Colour about the Bigneſs of a *Chafinch*.

There be other ſorts of *Goldfinches* variegated with *Red*, *Orange*, and *Yellow* Feathers, very Specious and Beautiful.

Spar-

Sparrows not much different from the *Engliſh*, but they Build not in the *Eaves* of *Houſes* that ever I ſaw.

The *Snow Bird* which I take to be much the ſame with our *Hedge Sparrow*; this is ſo call'd becauſe it ſeldom Appears about *Houſes*, but againſt *Snow* or very Cold Weather.

The *Humming-Bird*, that feeds upon the *Honey* of *Flowers*. I have been told by ſome Perſons, that they have kept of theſe *Humming Birds* Alive, and *Fed* them with Water and Sugar; they are much the *Smalleſt* of all Birds, have Long *Bills* and Curious Coloured Feathers; but differ much in Colour.

Herons 3 or 4 ſeveral ſorts; one Larger than the *Engliſh*, Feathered much like a *Spaniſh Gooſe*; Another ſort that only comes in Summer, *Milk-White*, with *Red* Legs, very Lovely to behold.

The *Bittern* is there leſs than in *England*, and does not make that *Sounding Noiſe*, that ever I heard.

Curlews ſomething Leſs than our *Engliſh*, tho' Bigger than a *Wimbrel*.

The *Sand-Piper* much reſembling the *Engliſh*.

The *Snipe*, two ſorts, one reſembling *ours*, the other much Leſs.

The *Tewits* are ſmaller than the *Engliſh*, and have no long *Toppings*, but juſt like a Young one that begins to Fly.

There are great Numbers of *Wild-Swans*.

Wild-Geeſe and *Brent-Geeſe* all Winter in mighty Flocks; *Wild-Ducks* innumerable; *Teal*, *Wigeon*, *Sheldrakes*, *Virginia-Didapers*, the *Black-Diver*, &c.

In my Return home for *England*, *May* 1686. off of the *Banks of New-Found-Land*, when we were according to Account, 100 *Leagues* from the Shore, we ſaw ſeveral Prodigious Floating Iſlands of the *Ice*, no leſs to our Wonder than Terror; for they were very Dangerous. I got the Maſter to Sail one Day as nigh one of them as we ſecurely Durſt, which we judg'd to be full a *League* in Length, and was Higher above Water than the Top of our *Main-Maſt*: the *Snow* Drove too and fro upon it, as upon a large Plane. There was a great Flock of ſmall *Black-Divers*, that were not much bigger than a *Feldefare*, came to us a little before, but all of them then left us and betook themſelves to this Iſland of *Ice*. We ſaw, as I remember, nigh 30 of theſe Iſlands of *Ice*. Capt. *Rider*, being ſome few Days later in his Paſſage, and Bearing more to the Nore, told me, he ſaw many more of thoſe Iſlands of *Ice*, and ſome much Larger.

There are in *Virginia* a great many *Cormorants*; ſeveral ſorts of *Gulls*, and in and about the *Bay* many *Bannets*.

The Beaſts. n. 210. p. 121.

There were neither *Horſes*, *Bulls*, *Cows*, *Sheep*, or *Swine*, in all the Country, before the coming of the *Engliſh*, as I have Heard, and have much reaſon to Believe: But now amongſt the *Engliſh* Inhabitants there are good ſtore of *Horſes*, though they are very Negligent and Careleſs about the Breed. It is true, there is a *Law*, that no *Horſe* ſhall be kept *Stoned* under a *certain Size*: but it is not put in Execution. Such as they are, there are good Store, and as Cheap or Cheaper than in *England*, worth about

5 *Pounds*

5 *Pounds* a piece. They never *Shoe* them, nor *Stable* them in general: yet they Ride pretty ſharply; a *Planter's Pace* is a Proverb, which is a good ſharp Hand-gallop. The *Indians* have not yet learn'd to *Ride*, only the *King* of *Pomonkie* had got 3 or 4 *Horſes* for his own Saddle, and an Attendant, which I think ſhould in no wiſe be Indulg'd, for I look on the allowing them *Horſes* much more Dangerous than even *Guns* and *Powder*.

Wild-Bulls and *Cows* there are now in the *Uninhabited Parts*, but ſuch only as have been Bred from ſome that have Stray'd, and become *Wild*, and have Propagated their Kind, and are Difficult to be Shot, having a great Acuteneſs of Smelling. The Common Rate of a *Cow* and a *Calf* is 50 *s.* be ſhe Big or Little: they are never very Curious to Examine that Point.

Their *Sheep* are of a Middling Size, pretty Fine Fleeced in general, and moſt Perſons of Eſtate begin to keep *Flocks*: which hitherto has not been much regarded, becauſe of the *Wolves* that Deſtroy them; ſo that a piece of *Mutton* is a Finer Treat, than either *Veniſon*, *Wild-Gooſe*, *Duck*, *Widgeon*, or *Teal*.

Elkes I have heard of and there are abundance of Brave *Red-Deer*, ſo that a good *Woodſman*, as they call him, will keep a Houſe with Veniſon. The *Indians*, they ſay, make *Artificial* ſorts of *Heads* of Boughs of Trees, which they Conſecrate to their *Gods*, and theſe they put on to deceive the *Deer* when they go a *Shooting* or *Hunting*, as they call it, and by Miniking the Feeding of the *Deer*, they by degrees get within Shot.

Swine they have now in great Abundance: *Shoats*, or *Porkrels* are their General Food; and I believe as good as any *Weſtphalia*, certainly far exceeding our *Engliſh*.

Rackoon; I take it to be a Species of a *Monkey*, ſomething leſs than a *Fox*, Gray-Hair'd, its feet form'd like a Hand, and the Face too has likewiſe the reſemblance of a *Monkie's*: beſides, being kept Tame, they are very *Apiſh* They are very prejudicial to their *Poultry*, as I remember.

An *Opoſſom*, as big, and ſomething ſhaped like our *Badgers*, but of a Lighter *Dun-Colour*, with a long Tail ſomething like a *Rat*, but as Thick as a Man's Thumb. The *Skin* of its *Belly* is very Large, and Folded, ſo as to meet like a *Purſe*, wherein they ſecure their Young whilſt Little and Tender, which will as Naturally run thither, as Chickens to a Hen: In theſe *Falſe Bellies* they will carry their Young. They Feed on, and Devour *Corn*.

Hares; many will have them to be a *Hedge-Rabbet*, but I know not what they mean thereby. I take them to be a perfect Species of *Hares*, becauſe I have ſeen *Leverets* there with the *White Spots* in the Head, which the Old Ones have not, ſo it is in *England*; and the *Down* is perfectly of the Colour of our *Hares*; they *Sit* as our *Hares* do, and make no *Holes* and *Burrows* in the Earth. True, they are but about the Bigneſs of an *Engliſh Rabbet*, and Run no Faſter: they generally take into ſome Hollow-Tree within a little ſpace; which then the People catch by gathering the Wither'd Leaves, and ſetting them on Fire within the Hollow of the Tree,

and ſo Smoaking of them till they fall down. Sometimes they take long *Bryars*, and Twiſt them in the Down and Skin, and ſo Pull them forth.

Squirrels; there are 3 ſorts. The *Firſt* is the Great *Fox-Squirrel*, much larger than the *Engliſh*, and *Gray*, almoſt as a common *Rabbet*. Theſe are very Common; I have eaten of them at the beſt Gentlemens Tables, and they are as good as a *Rabbet*. The 2*d*. is the *Flying-Squirrel*, of a lighter *Dun-Colour*, and much leſs than the *Engliſh Squirrel*; the *Skin* on either ſide the *Belly* extended is very Large betwixt the Fore Leg and Hind-Leg, which helps them very much in their Skipping from one Bough to another, that they will Leap further than the *Fox-Squirrel*, though much Leſs; yet this is ſtill rather *Skipping* than *Flying*, though the Diſtinction be well enough. The 3*d*. is the *Ground-Squirrel*; I never ſaw any of this ſort, only I have been told of them, and have had them thus Deſcrib'd to me, to be little bigger than a *Mouſe*, finely Spotted like a young *Fawn*: By what I further apprehended, they are an abſolute ſort of *Dor-Mouſe*, only different in Colour.

Musk-Rats; in all things ſhap'd like our *Water Rats*, only ſomething Larger; and is an Abſolute Species of *Water-Rats*, only having a curious *Musky-Scent*. I have kept one for a certain time in a Wooden Cheſt; two Days before it Dy'd it was extraordinary *Odoriferous*, and *Scented* the Room very much, but the Day that it Dy'd, and a Day after, the *Scent* was very ſmall, yet afterwards the *Skin* was very *Fragrant*; the *Stones* alſo Smelt very well. They Build Houſes as *Beavers* do, in the *Marſhes* and *Swamps* by the Water-ſides, with 2 or 3 ways into them, and they are Finely Daub'd within; I pull'd one in pieces purpoſely to ſee the Contrivance; There were 3 different Lodging Rooms, very Neat, one Higher than another, as I conceive purpoſely made for Retirement, when the Water Riſes higher than ordinary: they are conſiderably Large, having much Traſh and Lumber to make their Houſes withal. I ſuppoſe they Live moſtly on *Fiſh*.

Bats, as I remember, at leaſt Two ſorts; *one* a Large ſort with *Long Ears*, and particularly long ſtraggling *Hairs*: the other much like the *Engliſh*, ſomething Larger, I think, very *Common*.

I never heard of any *Lions*; they told me of a Creature kill'd whilſt I was there, in *Gloceſter County*, which I conceiv'd to be a ſort of *Pard*, or *Tyger*.

Bears there are, and yet but few in the Inhabited parts of *Virginia*; towards *Carolina* there are many more. They are not very Fierce, their Fleſh is commended for a very Rich ſort of *Pork*.: but the *Lying* ſide of the *Bear*, as I remember, is but half the Value of the other, Weight for Weight.

There are ſeveral ſorts of *Wild-Cats*, and *Poll-Cats*.

Beavers Build their Houſes in like manner as the *Musk-Rats* do, only much Larger: and with pieces of *Timber* make *Dams* over Rivers; as I ſuppoſe either to preſerve their *Furrs* Dry in their Paſſage over the Rivers; or otherwiſe to Catch Fiſh by ſtanding to watch them thereon, and jumping upon them on a ſudden. They are very Subtile Creatures: and if half of the Stories be true that I have been told, they have a very Orderly *Government* amongſt them; in their Works each knows his Proper Work, and

Station,

Station, and the Over-ſeers Beat thoſe Young Ones that Loiter in their Buſineſs, and will make them Cry, and Work ſtoutly.

Wolves there are great ſtore; you may hear a Company *Hunting* in an Evening, and Yelping like a pack of *Beagles*: but they are very Cowardly, and dare ſcarce venture on any thing that Faces them, yet if Hungry will pull down a a good large *Sheep* that flies from them.

Foxes; they are very much like *Ours*; only their *Furr* is much more *Grizled*, or *Gray*.

Every Houſe keeps 3 or 4 *Mungrel Dogs* to Deſtroy Vermine; ſuch as *Wolves*, *Foxes*, *Rackoons*, *Opoſſoms*, &c. but they never *Hunt* with *Hounds*, I ſuppoſe becauſe there are ſo many Branches of Rivers, that they cannot follow them. Neither do they keep *Grey-Hounds*, becauſe they ſay, that they are ſubject to break their Necks by running againſt Trees; and any Cur will ſerve to Run their *Hares* into a *Hollow-Tree*.

They have great ſtore of *Land* and *Water-Tortoiſes*: but they are very Small; I think, I never ſaw any in that Country to exceed a *Foot* in Length. There is alſo another ſort of *Land-Tortoiſe*, different from the Common Sort, with a Higher Ridg'd Back, and Speckled with *Red* ſort of *Spots*.

Frogs they have of ſeveral ſorts; one of a Prodigious Largeneſs, 8 or 10 times as big as any in *England*, and it makes a Strange Noiſe, ſomething like the Bellowing of a *Bull*, or betwixt that and the hollow Sounding Noiſe that the *Engliſh Bittern* makes. Another very Common ſort, which they call *Toads*, becauſe *Black*, but I think differs nothing from our *Black Frog*. They have *Toads* alſo like ours in *England*; and another Small ſort of *Frog*, which makes a Noiſe like *Pack-horſe-Bells* all the Spring long. Another little *Green Frog*, that will Leap Prodigiouſly; which they therefore call the *Flying-Frog*. There is frequently heard in the *Woods* a ſhrill ſort of Noiſe, much like that our *Shrew-Mouſe* makes, but much ſharper; I could never learn the certainty what it was that made this Noiſe, it is generally in a Tree, and ſome have aſſerted to me, that it was made by the *Green-Frog*, yet I ſcarcely believe it. Mr. *Baniſter* aſſur'd me, it was made by a ſort of *Scarabeus Beetle*, that is I think full as big as the *Humming-Bird*; but neither do I believe that, for this Reaſon, for I never ſaw that *Beetle* ſo Low as the *Salts*, but always as High up in the Country as the *Freſhes*, and that Noiſe is frequent all over the Country.

Lizards, that are Gray, and very Common; the *Snakes* feed much on them, for I have taken ſeveral of them out of the Bellies of *Snakes*.

Snakes about 7 ſeveral ſorts. The *Rattle Snake*, ſo call'd from certain *Rattles* at the End of the *Tail*; theſe *Rattles* ſeem like ſo many Periſh'd Joynts, being a Dry Husk over certain *Joints*, and the common Opinion is, that there are as many *Rattles* or *Joynts* as the *Snake* is Years Old. I kill'd 4 or 5. and they had 11, 12 or 13 *Joints* each: but the Young ones have no *Rattles* of a *Year* or Two; but they may be known notwithſtanding, being very Regularly Diced, or Checker'd, Black and Gray on the Backs. The *Old* Shake and Shiver theſe *Rattles* with wonderful Nimbleneſs, when they are any ways diſturb'd; their *Bite* is very Deadly, yet not always of the ſame Force, but more or leſs Mortal accordingly as the *Snake* is in Force or

Vigour: and therefore in *June* or *July* much Worſe, and more Mortal, than in *March* and *April*. This *Snake* is a ſort of very Majeſtick Creature, and will ſcarce meddle with any thing unleſs Provoked: but if any thing Offend it, it makes directly at them. An *Indian* being *Bit* by one of theſe Snakes between the Fingers, ſtretched his Arm out as High as he could, calling for a String, wherewith he Bound his Arm as hard as poſſibly he could, and clapt a Hot Burning Coal thereon, and ſinged it Stoutly, whereby he was *Cured*, but look'd Pale a long while after. And I believe this truly one of the beſt ways in the World of *Curing* the *Bite* either of *Viper* or *Mad-Dog*. I was with the Honourable Eſquire *Boyle*, when he made certain Experiments of *Curing* the *Bite* of *Vipers*, with certain *Eaſt-India Snake-Stones*, that were ſent him by King *James the Second*, the *Queen*, and ſome of the Nobility, purpoſely to have him try their Vertue and Efficacy, For that End he got ſome Brisk *Vipers*, and made them *Bite* the Thighs of certain Pullets, and the Breaſts of others: he applyed nothing to one of the Pullets, and it *Dyed* within 3 *Minutes* and a *half*, as I remember; but I think they all Recover'd to which he apply'd the *Snake-Stones*, though they Turned wonderful Pale, their *Combs*, &c. immediately; and they became extream Sick, and Purged within *half* an *Hour*, and the next Morning all their *Fleſh* was turned *Green* to a wonder; never the leſs they recovered by Degrees. The manner of the Application was only by Laying on the *Stone*, and by two croſs Bits of a very ſticking *Diacuilum Plaiſter* binding it on, which he let not lye on paſt an *Hour* or Two, took the *Stone* off, and put it into *Milk* for ſome Time; ſome *Stones* were of much ſtronger Vertue than others. Hereon telling Mr. *Boyle* the Story of this *Indian*, he Approved the Method of *Cure*, and ſaid an *Actual Cautery* was the moſt Certain *Cure*. The *Poiſon* both of *Viper* and *Mad-Dog* (as I conceive) Kill by Thickning of the *Blood*, after the manner that *Runnet* Congeals Milk when they make Cheeſe. *Vipers* and all the *Viperous Brood*, as *Rattle-Snakes*, &c. that are Deadly, have I believe their *Poiſonous* Teeth *Fiſtulous*, for ſo I have obſerved that *Vipers* Teeth are, and the *Rattle-Snakes* very Remarkable: and therefore they Kill ſo very ſpeedily by *Injecting* the *Poiſon* through thoſe *Fiſtulous Teeth* into the very *Maſs* of *Blood*. But the *Bite* of *Mad-Dogs* is oft of long Continuance before it get into and Corrupt the *Maſs* of *Blood*, being it ſticks only to the Outſides of the *Teeth*, and therefore when they *Bite* through any Thickneſs of Cloaths, it rarely proves Mortal, the Cloaths wiping the *Poiſon* off before it come to the *Fleſh*. A *Girl* that was *Bit* about *New-Years Day*, continued well till *Whitſontide*, when coming to ſee Certain Friends in our Parts, ſhe fell very ill, and being a Poor Girl they came to me: it pleaſed God I recovered her. Some time after, ſhe return'd to give me thanks for ſaving her Life, being Two Perſons that were *Bit* with the ſame *Dog* were Dead, whilſt ſhe remained under *Cure*, and therefore ſhe was the fullier Convinced ſhe ow'd her Life to me.

But the *Poiſon* of *Vipers* ſeems to be like the *Injecting* of Liquors into the *Veins* of *Creatures*: Dr. *Moulin* and I made many Experiments of this Nature together, and I have made many more by my ſelf. We once I remem-

ber

ber *Injected half* a *Dram* of *Allom* into the *Jugular-Vein* of a *Dog* before the *R. Society*, (the *Allom* being only Dissolved in a little *Water)* which within something less than *one Minute*'s Time was so absolutely Dead, as not to have the least Convulsive Motion; and I have done the like with many other things besides *Allom*, but with some things it is more Curdled and Broken, than with others, and will Differ much both as to Colour and Consistence. *Salt-Petre* Kills much as quickly as *Allom*: but then the *Blood* in the *Heart* looks very Florid, Smooth, and Even.

In the little time I have spent in these sorts of Experiments, I easily perceive notable Discoveries might be made thereby: One *Dog* that Lived became *Lame* and *Gouty*; another with *Quick Silver* Dy'd, in about 16 *Weeks* time *Consumptive*, and I discovered *Quick-Silver* in the Impostumated parts of his *Lungs*. *Vid. Sup. Vol. III, Par. I. Cap. V. Sect. X. 1.*

But to return: The *Poison* of *Vipers* and *Mad Dogs* I suppose Kills by *Thickning* of the *Blood*, as many *Malignant Fevers* also do; in all which Cases I look on *Volatile Salts* to be the propereft *Physick*, as keeping the *Blood* from *Congealing*. I had a Singular Instance hereof in a Gentleman of *Yorkshire*, *Bit* with a *Grey-Hound* on the *Thursday*, not 3 *Minutes* before the *Dog Died Mad*; he *Bit* him in several places of the Hands, as he was giving him a Remedy. The *Monday* following the Gentleman was very Ill and came to *Wakefield* to an *Apothecary* his Acquaintance, who knowing not what to do desired my Assistance. When I came, the Gentleman could Talk, but every 2 or 3 *Minutes* he had Violent Fits, and would tell us, when they were over, that his *Brains* worked like *Birm* in an Ale-Fat, and seemed to Froth up at every Fit. The *Apothecary* had no *Volatile-Salt* of *Vipers*; so I took the *Volatile Salt* of *Amber*, and ordered him 10 *Grains* in *Treacle-Water* every *half Hour*: He told me every *Dose* seem'd to Clear his *Brain*, and *Cool* it as perfectly, as if a Bason of Cold Water were pour'd on his Head, but it return'd by Degrees again. Having then a *Volatile Salt* by me that *Vomits* very well, I gave him a *Dose* thereof: it *Worked* very well, and he was very much better after it. I then ordered him to continue the *Volatile Salt* of *Amber* once every 4 *Hours*, and at each 2 *Hours* end, (that is, betwixt) *Spec. Pleres Archonticon* and *Rue* Powder'd, *ana gr.* 15. whereby he was so well Recovered that within 2 *Days* he would needs go home, and I heard no more of him for *half* a *Year*; when I was fetch'd one Morning to him in great Hast. He had been abroad, play'd the Good-Fellow, and in his Return home, having Rode a great day's Journey, being Wearied and I suppose finding himself Indisposed, he staid all Night in our Town, it being fortunately in his way. In the Morning when he should have got up, he could not stand, whereupon the *Apothecary* was sent for, and a *Surgeon* to *Blood* him, which was accordingly done, but he grew Worse; for in this Case I look upon *Bleeding* to be very prejudicial, as well as in most *Malignant Fevers*, for thereby the *Spirits* are Diminished, and the *Blood* Congealed the sooner. When they had done all they could, and the *Symptoms* still increased, they at length sent for me. I never saw a Man or Creature in that *Agony*, all my Life, that I found him in; Senseless and *Mad*, when at best, but every *Minute*

nute the Fierceſt *Shiverings* ran through him; his *Eyes* would firſt Roll and then ſet, as if ready to Start out of his Head; but above all, the *Swelling* and *Luctation* at his *Breaſt* was as if he would Burſt, which went off with a prodigious *Sigh*. All this I judge the effects of the *Heart* Labouring to diſcharge it ſelf of the *Stagnating Blood*, and the *Nervous Convulſions* as Conſequents thereof. And I am the more Confirm'd in this, from what I ſaw in a *Woman* that was *Bit* alſo with a *Mad-Dog* in the Leg, and fell ill the very Day that ſhe paid the *Chirurgion* for her *Cure*: and notwithſtanding all that could be done, growing Worſe, they ſent for me. I went, and found her with what is call'd *Hydrophobia*: She would look earneſtly after *Drink* or *Water*, and ſeem'd to Deſire it, but as ſoon as ſhe began to Drink, away it went, be what it would, with the greateſt Violence ſhe could poſſibly Fling it. I gave her the *Vomit* hereafter and alſo before-mention'd, but ſhe got but little of it Down, and I had no more with me; nevertheleſs it ſo Brought her to her ſelf, that ſhe could Anſwer Queſtions, and I asked her, whether ſhe was afraid of the *Drink* and *Water*, when ſhe Flung the Cups in that Violent manner from her? She ſaid, No; but when ſhe Offer'd to Drink her *Breaſt* and *Heart* would not let her. I asked, whether through any *Averſion* or *Fear*? She ſaid, No; ſhe was very Thirſty; but when ſhe offered to Drink it ſtruck to her Heart, and ſtopp'd her Breath. That is as I apprehend, the *Cold Drink* paſſing down the *Throat* ſtruck a *Chilneſs* in the *Blood*, and made it readier to *Stagnate*: beſides, the very *Act* of *Drinking*, hindring the *Free Breathing*, Conduced alſo much thereto: and therefore the Heart was ſo ſuddenly Oppreſſed, that ſhe could not forbear Flinging away what ever ſhe had in her Hand. She Complained alſo of a great *Rigour* and Stiffneſs or Straitneſs of the *Muſcles* of her *Breaſt*, ſo that Poſſibly the *Spirituous Liquor* that flows in the *Genus Nervoſum* may be *Congealed* as well as the *Blood*; or the ſame Effects may be Suppoſed, notwithſtanding, to be the Reſult of the *Condenſed Blood* Clogging both the *Heart* and *Lungs*, ſo that the *Breaſt* may ſeem to be ſtraitned therewith. The ſame I judge to be the Cauſe of all the *Violent Luxations* in this Gentleman, whoſe Fingers I look'd on, and found the Places where he had been formerly *Bit* turn'd *Blackiſh*, and much Inflamed about them, which Confirmed me in my Sentiment, that it was a Relapſe of his former Diſtemper; that is, of the *Bite* of the *Mad-Dog*. I gave him the Former *Vomit* of *Volatile Salts*, and he ſhortly after Cried, This Fellow in *Black* has done me Good, and after the *Firſt Vomit* came ſo to himſelf, as to know us all. I *Vomited* him every other Day with this *Vomit* for 3 times, and made him in the Interim to take *Volatile Salt* of *Amber*, and the aforeſaid Powders, aad to Waſh his Hands, and Sores in a ſtrong *Salt-Brine*; to Drink Poſſet-Drink with *Sage* and *Rue*, and by this Courſe and the Bleſſing of God his Life was ſaved, and he perfectly *Cured*, for it is now 4 *Years* ſince, and he has had no *Relapſe*. I have Cured ſeveral others by the ſame Method.

Coll. *Spencer*, the *Secretary of State* in *Virginia*, a very Serious and Ingenious Gentleman, told me that his Servant brought him Word once that a

Sow

Sow having Farrow'd, a *Rattle Snake* was got into the Den, and had Kill'd the Piggs. The Coll. went to see the *Snake*, which they said was still Coyl'd in the Den; there followed them 2 or 3 *Mungrel Curs*, and they set one of the *Dogs* at the *Snake*, which was too quick for the *Dog*, and snapt him by the Nose, whereupon he set a *Howling* and Ran immediately into the Adjacent River, and Died very shortly after. Another of the *Dogs* upon the like Attempt was bit by the *Snake* also, and fell a *Howling* and *Froathing*, and *Tumbling*; but being he Died not so soon as the other *Dog*, they fetched some of the *Herb* which they call *Dittany*, as having a great Traditionary Vertue for the *Cure* of *Poisons*: they Pounded it, and Adding a little Water, Expressed the *Juice*, and gave the *Dog* frequently thereof: nevertheless he *Died* within a *Day* or *two*. The *Howling* of the *Dogs*, he suppos'd, gave Notice to the *Sow*, and made her come Furiously Brisling and Run immediately into her Den; but being likewise *Bit* by the *Snake*, she set up a Terrible Squeak, and Ran also into the River and there Died.

A Gentlewoman told me, That a Neighbour being *Bit* by a *Rattle-Snake Swell'd* excessively; some Days afterwards she was sent for, who found him *Swell'd* beyond what she thought it had been possible for the Skin to contain, and very *Thirsty*. She gave him *Oriental Bezoar* Shav'd, with a strong *Decoction* of the aforesaid *Dittany*, whereby she Recover'd the Person. Asking him afterwards, what he *Felt* when the *Snake* First Bit him? He told me, that it seem'd as if a *Flash* of *Fire* had run through his *Veins*.

Besides the *Rattle-Snake*, there is the *Blowing-Snake*, an absolute Species of a *Viper*, but larger than I have seen any in *Europe*. It is so call'd because it seems to *Blow* and Spread its Head, and *Swell* very much before it *Bite*; which is very Deadly. It is Remarkable there is none of their *Snakes* there, that make any of that *Hissing* Noise that ours in *England* make, but only Shoot out their *Tongues*, *Shaking* them as ours do, without any Noise at all.

There is another sort of Deadly *Snake*, call'd the *Red-Snake*; they are of an Ugly *Dark Brown* Colour, inclining to *Red*; Their Bellies are of a more *Dusky White*, with a large Streak of *Vermilion Red* on either side; This too is of the *Viper-kind*.

The *Horn-Snake* is, as they say, another sort of Deadly *Snake*; I never saw any of them, unless once, shortly after my Arrival in that Country, which I cannot attest to be the *Horn-Snake*, for I could not distinctly view it. It was perch'd up about 2 *Foot* High in a *Sumach* Branch, its *Tail* Twisted about the Shrub, and about a *quarter* of a *Yard* stood holt forward, leaning over the Forked Branch thereof. I could not see the *Horn*, which they Say it has in its *Front*, wherewith it Strikes, and if it Wounds, is as *Deadly* as the *Rattle-Snake's Bite*. This I think may not improperly be refer'd to the *Dart-Snake*.

The *Black-Snake*, is the Largest, I think, of all others, but I am sure the most Common; I have kill'd several of them full 6 *Foot* long, their *Bite* is not Deem'd *Mortal*, but it Swells and Turns to a *Running Sore*; they

Feed

Feed upon *Lizards*, *Mice*, *Rats*, *Frogs* and *Toads*, which I have taken out of their Bellies. I was once a *Simpling* in the Woods, on a Fair Sun-shiny Day, when I saw a *Snake* Crawling on a Tree that was Fallen, and *Licking* with its *Forked Tongue* as it mov'd; I stood still to observe it, and saw it *Lick* up Small *Insects* and *Flies*, with wonderful Nimbleness, Catching them betwixt the *Forks* of its *Tongue*.

The *Corn-Snake* is most Like the *Rattle-Snake* of all others in Colour, but the *Chequers* are not so Regular, neither has it any *Rattles*. They are most frequent in the *Corn-Fields*, and thence I suppose so call'd; The *Bite* is not so *Venemous* as the *Black-Snake's*. The *Water-Snake* is a Small Snake; I never saw any of them above a *Yard* long, tho' I have sometimes seen 40 or 50 at once. They are of an ugly *Dark-Blackish* Colour: They say, they are the Least *Venemous* of any.

An Account of Mary-land; *by Mr.* Hugh Jones. *p.* 259, p. 439.

XX. *Cheesepeak-Bay*, which runs N. b. W. about 200 *Miles* or more, Divides *Maryland* as well as *Virginia* into Two Parts, which we call the *Eastern* and *Western Shores*. The whole Province contains 11 *Counties*; 6 on our side, which is the *Western*, and 5 on the *Eastern Shore*. The Land is generally *Low* on both sides. No *Hill* that I have seen or heard of among the Inhabitants 50 *Yards* Perpendicular: but about 100 *Miles* West of us, towards the *Heads* of the *Rivers*, the Ground Rises and Appears in very High *Mountains*, and Rocky *Precipices*, running North and South, from the Top of which a Man may have a Clear Prospect of *Virginia* and *Maryland*.

All the *Low-Land* is very *Woody*, like one continu'd *Forrest*; no Part Clear'd but what is Clear'd by the *English*: And tho' we are pretty Close Seated, yet we cannot see our next Neighbour's House for Trees. Indeed in Few *Years* we may expect it otherwise: for the *Tobacco Trade* destroys abundance of Timber, both for making of *Hogsheads*, and Building of *Tobacco-Houses*; besides *Clearing* of Ground Yearly for *Planting*. Our *Soil* is generally *Sandy*, Free from *Stone*, which makes it very convenient for Travelling; and we have no occasion for *Shoeing* our Horses, except in *Frosty* Weather. And what with the Goodness of our Little *Horses*, and the Smoothness of the *Roads*, we can Travel, upon occasion 50 *Miles* in a Summer's Afternoon, and sometimes 100 *Miles* in a Day: indeed our *Miles* are not accounted so long as in *England*. The Rich and Plentiful Gifts of Nature Add much to the Happiness of the Place; the three Elements affording Plenty of *Food* for the use of Man, *viz.* *Deer*, *Fowl*, both *Water* and *Land*, in abundance: and for the preserving of *Health* many excellent *Herbs* and *Roots*, the discovery of whose Vertue is chiefly owing to the *Indians*.

We have for *Timber*, several sorts of *Oak*, *viz.* the *Red*, *White*, *Black*, *Chesnut*, *Water*, *Spanish* and *Line-Oaks*; which last bears a Leaf like a *Willow*. We have also *Cedar White* and *Red*: The *Red* serves only for Posts and Groundsils, the *White* to Rive or Split into *Boards*, that being the freest from Knots, and goes under the Name of Cypress, but I think Falsly. Here is a Tree we call *Cypress*, which is extraordinary Large in Bulk, and

bears

bears a Leaf like the *Senſitive-Plant* : it is Soft and Spungy ; will not Rive, and is fit for no Uſe. We have *Black-Wallnut*, which is mightily Eſteem'd by the Joyners for its *Grain* and *Colour*. Here is a ſort of *Poplar* that makes good White Plank ; it is a Large Tree, and bears a *Flower* like a *Tulip*. We have alſo Plenty of *Pine* ; and *Dog-wood*, which is a Fine *Flower-bearing Tree* ; *Saſſafras* ; *Locuſt*, a Tree of very Quick Growth, and very Durable in Building ; *Hickery*, of which we have Two ſorts, *Red* and *White*, this ſerves chiefly for *Fire-Wood*, being the beſt for that Uſe. We have alſo plenty of *Cheſnuts* and *Chinquapine* another Species of *Cheſnut* ; and a ſort of *Elm*, like a *Dutch Elm*, which we call the *Sugar Tree*, from the *Sweetneſs* of its Juice, with which ſome have made good *Sugar*. Here is alſo a ſort of *Elder*, whoſe Bark is cloſely guarded with *Prickles* like thoſe of a *Briar*. *Tulip-bearing-Laurel*, and *Myrtle* of ſeveral ſorts ; one whereof bears a *Berry* with which they make, in the *Eaſtern Shore*, *Green Wax*, very proper to make *Candles* if mix'd with *Tallow*.

Among the Inhabitants of the *Air*, which are very numerous, the *Humming-Bird* is the moſt Curious ; they continue with us all Summer, Feeding only on *Flowers* like *Bees* : and the *Mocking-Bird*, for *Various Notes*, exceeds all the Birds, I believe, in the World.

Of all our *Reptiles*, the *Rattle-Snake* is the moſt Noted ; and what is commonly Reported of its *Charming Birds* and *Squirrels*, &c. is not Groundleſs : for it hath been affirm'd to me by ſeveral Eye Witneſſes.

The *Air* is now more *Wholeſome* than formerly : which I ſuppoſe proceeds from the Opening of the Country, that giving the *Air* a Freer Motion : Our *Summers* are not Extream *Hot*, as in the Firſt Seating ; But our *Winters* are generally *Severe*, towards what they are in *England*. The *North Weſt Wind* is very Sharp in Winter, and even in the Heat of Summer it mightily Cools the Air ; and too often at that time a ſudden *North-Weſtern* ſtrikes our Labourers into a *Fever*, when they are not careful to provide for it, and put on their Garments while they are at Work.

We have Little or No *Woollen* or *Linnen Manufacture* follow'd by any of us, except what is done in *Somerſet County* over the *Bay* : But *Tobacco* is our Meat, Drink, Cloathing and *Monies* ; not but that we have *Money* both *Spaniſh* and *Engliſh* pretty Plenty, which ſerves only for *Pocket Expences*, and not for *Trade*, *Tobacco* being the *Standard* for *Trade*, not only with the Merchants, but alſo among our Selves. Our common *Drink* is *Syder* ; which is very Good, and where it is rightly order'd not inferior to the beſt *White Wine*. We have *Wine* brought from *Madera* and *Fayal* ; *Rum* from *Barbadoes* ; *Beer*, *Mault*, and *Wines* from *England*. We have Plenty of good *Grapes* growing *Wild* in the Woods : but there is no Improvement made of them.

We are *Govern'd* by the ſame *Laws* as in *England*, only ſome *Acts of Aſſembly* we have relating to ſome particular Caſes not under the Verge of the *Engliſh Laws* : or where the *Laws* of *England*, do not ſo Aptly Provide for ſome Circumſtances, under which our Way of Living hath put us. The *Church* of *England*, God be praiſed, is pretty firmly Eſtabliſh'd among

us. *Churches* are Built and there is an *Annual Stipend* allow'd to every *Miniſter* by a *Perpetual Law*, which is more or leſs according to the Number of Taxables in each *Pariſh*, every *Chriſtian Male 16 Years* Old, and *Negroes Male* and *Female* above that Age pay 40 *Pound* of *Tobacco* to the *Miniſter*, which is Levied by the *Sheriff* among other Publick Levies; which makes the Revenues of the *Miniſters*, one with another, about 20000 *Pound* of *Tobacco*, or *One hundred Pound Sterling per Annum.* It hath been the Unhappineſs of this Country that they have had no *Proteſtant Miniſters* hardly among them till Governour *Nicholſon*'s time (who has been a great Promoter and Encourager of the *Clergy*) but now and then an *Itinerant Preacher* of very Looſe Morals, and Scandalous Behaviour; ſo that what with ſuch Mens Ill Examples, the *Roman Prieſts* Cunning, and the *Quakers* Bigotry, *Religion* was in a manner turn'd out of Doors. But, God be Praiſed, things now ſtand better, and our *Churches* are Crowded as full as they can hold, and the People are pretty ſenſible of the *Roman* Superſtition, and the *Quakers Madneſs*; ſo that their Parties both Joyn'd together are very Inconſiderable to what ours is. Indeed the *Quakers* Struggle hard to maintain their Footing, and their *Teachers* (eſpecially the *Female Sex*, who are the moſt Zealous) are very free of their Taunts and Contumelies againſt us, but 'tis to little Purpoſe, unleſs to make their own way more Ridiculous and Odious.

We have not yet found the way of Aſſociating our ſelves in *Towns* and *Corporations*, by reaſon of the fewneſs of Handicrafts Men. There are indeed ſeveral Places allotted for *Towns*: but hitherto they are only *Titular* ones, except *Annapolis* where the *Governour* Reſides. Governour *Nicholſon* has done his endeavour to make a *Town* of that: there are in it about 40 Dwelling Houſes, 7 or 8 whereof can afford good Lodging and Accommodations for Strangers. There is alſo a *State-Houſe*, and a *Free-School* built with *Brick*, which make a Great Shew among a parcel of Wooden Houſes, and the *Foundation* of a *Church* Laid, the only *Brick Church* in *Maryland.* They have two *Market Days* in the Week; and had Governour *Nicholſon* continu'd there ſome *Years* longer, he had brought it to ſome Perfection.

As for our Predeceſſors, the *Indians*, I cannot give you at preſent any further Account of them than this, *viz.* That whereas at the Firſt Seating of *Maryland* there were ſeveral Nations of *Indians* in the Country, Govern'd by ſeveral Petty *Kings*: now I do not think that there are 500 *Fighting Men* of them in the Province; and thoſe are moſt on the *Eaſtern Shore*, where they have 2 or 3 Little *Towns.* Some of them come over to our *Side* in Winter-time to *Hunt* for *Deer*, being generally employ'd by the *Engliſh*; they take Delight in nothing elſe: and it is rare that any of them will Embrace our way of *Living* or *Worſhip.* The Cauſe of their *Diminiſhing* proceeded not from any *Wars* with the *Engliſh*; for we have had none with them: but from their own perpetual Diſcords, and *Wars* among Themſelves. The *Female Sex* alſo have Swept away a great many; ſo that now they are Dwindled almoſt to nothing. One thing is Obſervable in them, tho' they

are

are a People very *Timorous* and *Cowardly* in *Fight*, yet when taken *Priſoners* and Condemn'd, they'l *Dye* like Heroes; Braving the moſt Exquiſite *Tortures* that can be Invented, and *Singing* all the time they are upon the *Rack*.

XXI. The *Gramen Iſchæmon*, call'd by others *Gramen Dactyloides*, or *Sanguinella*; and the *Gramen Aquaticum cum Longiſſima Panicula*, mention'd by *Bauhinus*, Grow here (about *Franckfort* on the *Oder*) in great Plenty. In the *Foreſt*, call'd the *Hartz*, there are very Conſiderable both *Copper* and *Silver-Mines*; Store of *Lapis Fiſſilis*; and a ſort of *Stone*, which by *Rain* grows altogether *Soft*; and a Place call'd *Bowman's Hole*, like that of *Oky-Hole* about *Wells* in *England*.

Obſervables near Franckfort *on the* Oder; *by* Joh. Chr. Beckman. n. 39. p. 773.

XXII. S. *Borelli*, pretends to have Lighted upon a way of Building *Gallies* with ſeveral *Tires* of *Oars*, of different heights; which he eſteems to be more Convenient, more Speedy, and Stronger than thoſe that are now in uſe. He thinks alſo, that he can give an account of the Poſſibility of the *Gallies* of the *Ancients* to a Determinate Number of *Tires*.

Some Communications *from* Italy; *by*..... n. 114. p. 309.

There is at *Rome* a Bowl, which is ſo Counterpois'd, that it can ſtop of it ſelf upon an Inclining Plane like *Kepler's* Watch. it ſtops upon all ſorts of Matter and even upon a *Looking-Glaſs*.

XXIII. I took notice in the Univerſity of *Bononia* of this *Inſcription* made in Commendation of the deſervedly Famous *Malpighi*. It is in the upper Gallery in a Large *Baſis* Painted in *Freſco*, with ſome *Figures* about it.

Obſervations in Italy; *by Dr.* Pet. Silveſter. n. 265. p. 627.

D. O. M.

Virtuti & Famæ in Ævum manſuræ Inclyti Viri M. Malpighii, Medicinæ Profeſſoris Celeberrimi, utraque Artiſtarum Univerſitas P. Anno Salutis. 1683.

And a little Lower,

Miraris Breve Lemma? Nomen Ingens ornari negat: eſt ſatis Referri. Juſſum Cætera tacere Marmor. Omnis Malpighium Loquetur Ætas.

I have made ſome Obſervations upon the *Bronchocele*, a Diſtemper very frequent all over *Lombardy*, and *Savoy*. By the Diſpoſition of this *Tumor*, I am ſatisfy'd it has principally its Seat in the *Glandulæ Thyroideæ*, and ſometimes too, but very ſeldome in the *Parotis Conglobata*. I could plainly ſee the *Parotides Conglomeratæ* were no wiſe Concern'd. This I have obſerv'd in ſeveral *Bronchoceles* of a very great Bigneſs. I conceive theſe *Tumors* (that are generally attributed to the *Water* the People Drink that is *Melted Snow*) do proceed a *Lentore Lymphæ*, which by degrees extend the *Folliculi Glandularum Membranoſi*; and being there Congeal'd, harden them to that Degree, that an Inveterate *Bronchocele* is almoſt like a *Stone*. But why theſe *Swellings* are to be ſeen no where elſe, but in theſe *Glands*

Glands of the *Neck*, it is difficult to give a good Reason. It may be the Natural Conformation of the *Glandulæ Thyroideæ*, (which being Harder and of a more Solid Substance than other *Glands*, give sooner a stop to the *Lympha Lenta & Viscida)* is the occasion of this *Tumor*'s always Beginning and Settling there.

The *Sal montis Vesuvii* is found in pretty large Lumps after Mount *Vesuvius* has Spew'd out a vast quantity of *Ashes*. The great Rains that fall upon these *Ashes* make a sort of *Lees*, which left in the Hollow Places are Evaporated by the Heat of the Sun, and there remains this *Urinous Salt*, whose *Taste* is something like *Sal Armoniack*.

At the *Sulfatara* between *Naples* and *Puzzolo* they make *Allum* in this manner: In Summer time they gather as much as they have Occasion for, of an *Earth* that is there in the middle of a large *Area*, and they keep it in a *Dry* Place. They put it in *Lead-Coppers* of a good Thickness, and Pour upon it *Rain-Water*, which is also Impregnated with the same *Mineral*; for that purpose they take great Care to Dig some large Holes to preserve in them the Rain-Water, and they carry it to a large Cistern by the *Coppers*. They take away the *Earth* when the *Lixivium* is made, and as it grows Stronger by Evaporation, they put it from one *Copper* into another, till it is sufficiently Evaporated. Then they take it out and Convey it into a *Wooden Tub*, where, after it is Cool'd, you see the *Allum* stick to the sides in the form of *Chrystals*. But the most remarkable thing is, that these *Coppers* are Placed upon some of the Great *Spiracula* and that without any Expence in *Fuel*, only by the *Violent Heat* of these *Effluvia*, the Evaporation is constantly made sufficient for that *Christallization*. All this *Laboratory* where are the *Coppers* and the *Cistern*, with the *Tubs* is only Tiled over. The Governours of the Great *Hospital* of the *Annunciata*, who have been at the Charge of this Ingenious Contrivance, do make now about 3 or 400 *Pounds* a *Year* by it.

All Summer long some Labourers dig up and down in several Places of the same *Area*, as if it was in a Kitchin-Garden: and by those means they give way to the Copious *Sulphureous Steams*, that are within the Bowels of all this Mountain. Then out of the Superficies of that *Earth*, by the means of *Earthen-Pots*, they *Sublime* the *Brimstone*.

At the Mouth of the Largest *Spiracula*, where is an Excessive *Heat*, and continual *Noise* and *Smoak*, is found a sort of a *Native Sal Armoniack*: It seems the copious *Steams* come out in *Forma Liquida*; for if you put in a Key, a Sword, or any thing Solid, these *Effluvia* will stick immediately to it, and Drop down like Water. All this Mountain ought to be extraordinary full of *Mineral* Substances: for we see these *Effluvia* when they are *Sublimed* to the Top of the *Spiracula*, do stick there to Tiles or Stones, where they form this *Salt*: of which they gather *Yearly* about 200 *Pound* Weight. It has much of the Taste of the *Factitious Sal Armoniack*: and as a Learned Physician told me, being *Distill'd* in a *Sand Furnace*, it yields a *Volatile Urinous Spirit* absolutely like *Sal Armoniack*, as to the Sensible Qualities, and all other Effects; He only observ'd that *Spirit*

had

had ſomething *Aluminous* in it, and that to correct it they uſed to Add a greater Quantity of *Quick-Lime*, or *Sal Tartari*, than in the *Common Spirit's* Diſtillations.

XXIV. 1. There is an Hill nigh *Sarvizza*, Two Days Journey on this ſide *Lariſſa*, which conſiſts of an *Earth* of a Fine *Red* Colour, out of which the *Red Earthen-Veſſels* of that Country are made; as alſo a great number of *Acidulæ* nigh *Tranſchin* in *Hungary*, there being 32 Plentiful Springs of them; likewiſe an *Hot-Bath* nigh *Bellachergua* in *Bulgaria*, Scituated far from any Habitation, yet well Built by the *Turks*, and very Refreſhing to Travellers. It hath a *Red Sediment*, and maketh a *Gray Stone*. *Obſervations in Turkey; by Dr. Edw. Brown.* n. 59. p. 1051.

Being at *Lariſſa* in *Theſſaly*, where the *Gr. Segnor* hath long Reſided, I underſtood that he had paſs'd a good part of the Hot Summer of 1669. upon the neighbouring Mount *Olympus*: and by the Interpreters to the *Emperor*'s Reſident, the *Illuſtriſſ°. Signor di Caſa nova*, (who were oblig'd to attend the *Sultan* upon the Mountain) I was inform'd, that there was a *Spring* of *Whitiſh Water* upon that Hill, which was Drunk of by many Perſons in their great Heat and Thirſt, contracted by Aſcending the Mountain, but prov'd very Deſtructive to them in 3 *Days*; they then Complaining of an Heavineſs and Coldneſs of their *Stomachs* till they Dy'd.

2. There is a Diſeaſe which reigns in the Country about *Aleppo*, and as far as *Bagdat*, Invading both *Sexes*, all ſorts of *Ages*, and Strangers as well as Natives. 'Tis commonly call'd *Il mal d' Aleppo*, and appears to be in the *Skin* a ſmall *Puſtula* or *Wheal*, Hard and Red, the Head whereof is ſcarce bigger at the Beginning than the Point of a Pin: afterwards growing Bigger, and being Nouriſht by 5 or 6 little Roots or Fibres, it goes on to its Height for the ſpace of about 6 *Months*, and in as many more comes to its Declination; ſo that the whole Period of this *Diſeaſe* is generally compriſed within the ſpace of one *Year*. But this *Puſtula* hath hitherto yielded to no *Remedies*, neither in the Beginning, Middle or Declination: but hath rather been Exaſperated by them, though they were *Anodyna*. It is wholly to be left to Nature: and if you do, there is no Pain or Trouble in it. It takes People not once, but often: and it Seizeth on ſeveral Parts of the Body; and if it do ſo on the Face (as often it doth) it cauſes a remarkable *Scar*, which yet by little and little Vaniſheth. *By*---------- n. 93. p. 6017.

As to *Fevers* at and about *Aleppo*, though they have the ſame *Type* there as in *England*: yet there are Two things Peculiar in them. One is, that in *Acute Fevers*, *Cold Sweat* commonly Signifies *Recovery*, but *Hot Sweat* Portends *Death*. The other is, that in ſuch *Acute Fevers* even an *Intermitting Pulſe* Denounces no *Danger*.

Touching the *Leproſy*, which was Anciently ſo frequent a Malady in theſe Countries, 'tis now ſcarce to be found there; though at *Damaſcus* there is ſtill an *Hoſpital* ſtanding, formerly Built for the Relief of Perſons thus Diſeaſed.

As for the Reaſon, why the City of *Conſtantinople* is ſo much Subject to the *Plague*; ſome are of Opinion, that the Multitude of *Slaves*, Yearly brought

brought by the *Black-Sea*, and their Hard Diet and Uſage, begets this Corruption. Other judge, That the Commonalty there, Feeding, for the greateſt part of Summer, on *Cucumbers* and *Melons*, and Drinking Water upon them, without the uſe of Helps to Correct the Crudities, fall into *Malignant* and *Peſtilential Fevers*. But the Phyſicians generally Conclude, That the *Air* of *Conſtantinople* is Infected by the *North-Eaſt-Winds*, which Blow commonly for 3 *Months*, beginning about the *Summer Solſtice*, ariſing from Unwholſome Marſhes in *Tartary* and *Muſcovy*, and paſſing over the *Black-Sea*, (a Place known to abound with *Fogs*) bring with them certain Diſpoſitions tending to Corruption; which Working upon Bodies already Prepared by Bad Diet, may well be judg'd, they ſay, to be the Cauſe of this Diſtemper.

Beſides the other uſes of *Opium* in *Turky*, 'tis common in *Arabia* to Cure Horſes with it of the *Griping* of the *Guts*.

As to the *Turky* Way of *Dreſſing Leather*, it is to be obſerv'd, that their *Leather* is nothing ſo Strong and Serviceable as that in *England*: an aſſur'd Proof whereof is the Wearing. And though it be commonly Reported, that the *Leather* in theſe Parts, though Thin and Supple, will Hold out Water: yet this is to be Underſtood, that the *Turks* in their *Winter-Boots*, between the Lining and the Leather, put a *Sear-Cloth*, which being curiouſly ſow'd in the Seams, will keep out Water, though you put them in it for divers *Hours* together. In Cleaning of their Leather, they uſe *Lime* and *Album Græcum*; and inſtead of *Bark* of *Trees*, they employ *Valonia*, a ſort of *Acorn* growing on the *Oaks*. I am perſwaded that our *Acorns* in *England*, if they could be Spar'd for it, would perform the like Effect, and perhaps Better, ſeeing that many times the *Valonia* Burns the *Leather* ſo much as to make it little Serviceable: whereas our *Acorns* are probably more Temperate, and ſo might better ſerve the Turn.

Medical *Obſervations in the* Northern Countries; by *Dr.* Phil. Lloyd. n. 256. p. 310.

XXV. *Balnea* nuſpiam frequentiora ſunt quam in *Lithuania*: *Balneum* ingreſſi poſtquam largiter Sudarunt, *Cucurbitas* ſibi apponi faciunt, aut virgis Tergum cædunt uſque ad inſignem Ruborem. Inter *Coſacos* quoque ſi quis graviter infirmatur, *Balneum* ingreditur, & Corpus tegunt certis Herbis, Partique Dolenti applicant certum *Cornu Cavum* ad Veſicam attrahendam, quâ ruptâ effluit *Ichor* varii ſæpe Coloris, *Flavi*, *Viridis*, & *Nigri*, & Patiens convaleſcit; Varietas autem iſta *Colorum*, Herbis quibus Patiens tegitur aut Cornu Fuco aliquo imbuto adſcribi debet. *Coſacorum* quoque Cura multum in *Aqua-Vitæ*, aut Juſculis Acidis cum Oleo & Pipere ad *Sudorem* eliciendum, conſiſtit: nec abſtinent in Diæta à Carnibus cum Aceto & Cæpis coctis, quod *Bigoſt* vocant. Sicuti autem iſtæ Nationes *Pharmaceutica* non multum æſtimant, ita vice verſa ſunt prodigales quoad ea quæ ex Fonte *Chirurgico* petuntur, ut *Ven. Sect.* uſum *Sanguiſugarum* (quas etiam Palato & Gingivis intro applicant) *Fonticulos*, & *Trepanationem*; cujus uſus eſt valde frequens in *Suecia* bono cum ſucceſſu: habent enim *Sueci* Capita ſatis Dura & Urſina. Apud *Muſcovitas* uſus Herbæ *Theæ* ob viciniam cum *Chinenſibus*

Chinenſibus frequens eſt non ſolum in Decocto ſed in Subſtantia Pulveriſatam ſumunt pondere ʒß. cum *Aqua-Vitæ*.

Sunt apud ipſos *Paſtilli* certi Odoriferi & Flavi Coloris in uſu: per Nares attrahunt pondere *Gr.* IV. Ore aperto. Per duas Horas tanta copia *Muci Viſcidi* rejicitur, quantum vix *Catharticum* eliminare poſſit: quo Remedio curant omnes Affectus Capitis à Frigida cauſa ortos. Aliqui hauriunt fumum *Tabaci*, non per vices, ſed ſimul & ſemel, ex Tubulo capaci de hoc Fumo quantum poſſunt Deglutiendo: tunc corruunt in Terram non aliter quam *Apoplexia* Tacti; Somnum abbreviat Superveniens Vomitus & Alvi perturbatio, quod etiamſi non ſuperveniat, poſtquam expergiſcuntut Capitis levamen Sentiunt, & ſunt ad omnia bene diſpoſiti.

Natio *Tartarorum* ut plurimum à Teneris Lactis & Carnis *Equinæ* pabulo aſſueta, in continuis Equitationibus *Medicinam* quærens, præter Externa eaque *Empyrica*, pauca Interna excolit Remedia; *v. g.* dum quis graviter infirmatur, & eſt ſuſpicio *Febris Malignæ*, tunc capiunt *Lepuſculum* juvenem, cui incidunt *Arteriam Carotidem*, & *Sanguinem* Sugit Æger quamdiu poterit: poſtea *Pelle* detracta & calente tegit Caput, ſeque ad *Sudorem* & *Somnum* diſponit. Dum quis ex Captivis aut Servis *Febri* corripitur, tunc apprehensâ Comâ ipſum aliquantiſper exagitantes & circumrotantes in Aquam profluentem projiciunt, hocque modo Humores & Spiritus alterando procurant *Febrifugum*.

Hæc ſunt quæ ab Amico in Caſtris accepi, qui diu verſabatur in locis iſtis *Septentrionalibus*: idem mihi retulit *Coronidis* loco dari *Obfaſcinationem*, ſolo Aſpectu inductam, in *Lithuania* præſertim (credat qui vult) ubi Homines Effluviis Subtilibus ex Oculis emanantibus non modo aliis noceant ſed etiam Animalibus. Hoc Mali genus *Uroki* appellatur: ad quem Effectum producendum requiritur Approximatio Corporum viciniſſima, & deindè ne alter altero ſtet notabiliter editiore loco. Curantur tales precipue Balneo, *Origano*, *Hyperico*, aliiſque Herbis parato; Suffumigio ex *Crinibus*, *Unguibus*, aliiſque Partibus ipſius Obfaſcinatoris, ſi fieri poteſt, & Demum Sudoribus.

Inter *Tartaros*, ſi quis ex Equo vel alias Graviorem paſſus eſt Caſum, ante omnia illum ſtimulant ad *Urinam*, dein *Venâ Secta* Oſſa Equorum combuſta, vel certum *Albi Boli* genus, quo Terra illa abundat, ad ebibendum præbent.

Lac Equinum Acidum factum eſt illis Univerſale omnibus Morbis Calidis refrigerium, imo *Balſamicum Stomachale*.

In *Variolis* Infantum, loco *Venæ Sect.* apponunt *Moſcovitæ Cucurbitulas* Scarificatas Clunibus, ſubinde *Sangui-ſugas*; *Emulſiones* parant ex Semine *Napi*; Hauſtui imponunt *Album Græcum*.

Poloni habent certum Medicamentum Alimentoſum ipſis familiare, *Barſt* dictùm, quod Fermentum Stomachale Acido ſuo ſuaviter reſtaurat; & *Polonicæ* Nationis Crapulas, ex largiori Cremati Mulſi & Vini Generoſi hauſtu, vel ex Ciborum Calidorum copiâ contractas, conveniens: hoc Edulii Medicamentoſi genus ex *Branca Urſina*, vel ex Solo Pane Siligineo fermentato ſuo modo, conficere norunt in forma Decocti Herbacei Aquoſi.

Cæterum

Cæterum ſi quis Infirmari incipit, & conqueritur de ingenti *Capitis Dolore*, *Torminibus Ventris*, *Arthritide* vagâ, *&c.* Statim formatur ſuſpicio de *Plica*, ſive *Koltum*: nihil aliud ſatagunt quam *Plicam* in Capitis Capillis procurare; id quod Lotione ex *Erancâ Urſinâ* aliiſque Herbis, vel ſaltem mixturâ *Olei* & *Vini* ſæpius Lavando Caput, efficiunt. *Plicâ* ita procuratâ in Capite, videtur ipſe Morbus miteſcere, Materiâ Morbificâ criticè ſic tranſlatâ & Naturæ totum relinquitur Opus: quod plane indicat hunc Morbum ab alia Cauſa quam neglectu Pectinationis produci. Siquis Pectinando Divellere, aut Capillos Abſcindere tentat, in alium incidet Morbum, & *Sanguis* ſæpe effluit tanquam ex *Venæ* Ramulis Pilis abſciſſis, nec mirum hoc videri debet, cum *Pili* ex *Arteriæ*, *Venæ*, & *Nervorum* Ramulis, in Capſula incluſis, & poſtea extenſis formentur; ut patet *Autopſia*, ope *Microſcopii*, in Pilis Barbæ *Felis* aliorumque Animalium.

Quicquid de Cauſa *Plicæ* tradunt Authores vel nimis Genericum eſt, vel Imperfectum, & Inſufficiens: nam quod ad Aquas in *Ruſſia* ſpectat, & ſi certum ſit ex illarum Hauſtu cauſari; unde etiam dum Exercitus Militaris illas Partes tranſit ad Aquarum iſtarum Vada alii ſtant Vigiles Milites tranſeuntibus prohibituri ne Similes Aquas hauriant. Quæritur quomodo illi qui ad 100 *Leucas* inde diſſiti habitant, & ultra *Plicâ* corripiuntur? niſi forte nobis perſuadeamus Aquæ illius ex *Ruſſia* Venas propagari per totum Poloniam.

Cauſa Intrinſeca in *Glandulis* ſubcutaneis conſtitui poteſt, quo modo plures earundem Ductus & Pori conjuncti ſunt ac obliqui, ex quibus deinde *Pili* Copioſiores anguſtiore in loco poſiti, accedente ſimul *Glandularum* Succo nimis viſcido, intricantur & Complicantur: ſed & iſta Cauſa, cum extra *Poloniam* dari poſſit, ad Morbi *Endemii* Naturam ſola non ſufficit. Quamobrem cauſa adæquata paſſim in *Contagio*, partim Rerum non-naturalium uſu incongruo, quærenda, De *Contagio* non dubitandum, cum Familiare ſit Iteranti bus Lectos ſecum circumvehere; Aer ſatis Rigidus Boreali Acido coagulante abundat, unde Tranſpiratio Pituitæ illius Glutinoſæ circa *Pilorum* Radices hærentis facilè impeditur, vel maximè dum *Poloni* nudato Capite frequenter incedere conſueverunt.

Laborantes hoc Morbo habent Appetitum in certum Objectum defixum; alii ſolam Aquam expetunt, alii crematum, aliâ potulenta averſantes: ex ſimilibus Remediis in *Scorbuto* juvantur.

Præter *Febrem Malignam Hungaricam* dictam, occurrunt alii Morbi Levioris momenti *Endemii*, ut *Czemer*, *Porcellus Caſſovienſis*, *Strumæ*.

Czemer eſt Tumor aliquis ſub Carpis Manuum à Latere ſupra *Arterias*, adinſtar Nodi alicujus Mollioris, Dolorem dum tangitur excitans. Curatur *Emetico* & *Sudoriferis*.

Porcellus Caſſovienſis eſt Tumor Durus, inſtar *Porcelli*, Regioni *Lienis* incumbens, Incolis Civitatis *Caſſovienſis* familiaris, eſtque *Schirroſa* Diſpoſitio *Lienis* cum Flatibus *Colon* obſidentibus. Curatur Aperitivis.

Strumoſi in *Hungaria* non reperiuntur niſi circa Montanas Civitates, ubi *Auri* ſunt *Fodinæ*, propter Aquas *Mercuriales* & Effluvia Mineralium. Decreſente

creſente Lunâ Spongiâ combuſtâ Fumum Ore excipiunt *Strumoſi*, & reſiduum Cinerem Melli admixtum devorare ſolent in Principio; nam *Strumæ* Inveteratæ nullam admittant Curam.

XXVI. In *Iceland*, our *Air* is very Healthy all the Year long. The Diſeaſes which the Inhabitants are moſt ſubject to, are the *Cholick* and *Leproſie*. We have no *Phyſicians*; only 2 or 3 *Chirurgions*, that furniſh us with ſome Plaiſters for the dreſſing of Wounds. In our *Air* Iron *Ruſts* very ſoon. *An Account of Iceland; by Dr. Paulus Biornonius. n. 111. p. 238.*

The Changes of the *Weather* are uncertain, nor do they fall out according to the 4 Seaſons of the Year; ſome times it *Snows* as well as it *Hails* in the midſt of Summer: and the Winds Blow now and then moſt Furiouſly at the ſame Seaſon.

As to the *Froſt*, it Penetrates at moſt 4 *Foot* into the Earth. *Spirit* of *Wine* and *Oil* is free from being *Frozen*, much more *Quick-Silver*. We Preſerve our *Fiſh* from Putrefaction by Burying them in the *Snow*. Bodies *Frozen* do Swell, and are Changed in Taſte and Colour. The Figure of the *Snow* is various, and ſo is its Size. *Hail* is Roundiſh; the Greateſt is only of the bigneſs of Hail-Shot, that we kill Fowl with.

Of *Meteors* I have obſerved the *Ignis Lambens*, the *Draco Volans*, and frequently 2 *Mock-Suns*, with 3 *Rainbows* paſſing through them and the *True Sun*. We have no *Stated Winds*.

The *Depth* of our *Sea* Varieth, the greateſt about our Coaſt is 80 *Fathoms*. Our *Sea-Water* in Clear Nights being ſtruck with Oars, *Shineth* like Fire burſting out of a Furnace. The *Tides* obſerve the Motion of the *Moon*: The Sea *Swells* about the *Moon*'s *Riſing* and *Setting*; and it *Falls* when ſhe is *Southerly* and *Northerly*. The ordinary *Higheſt Tides* are not above 16 *Foot*, except in Autumn, when 'tis very Tempeſtuous, and then they *Riſe* ſometimes to 20 *Foot*. About the *Full* and *New Moon* are the Higheſt *Spring-Tides* and the loweſt *Ebbs*.

As for *Lakes* and *Springs*; of the former we have very many, and moſt of them on High Mountains, which are ſtored with *Salmons*: Of the latter we have Innumerable, guſhing out of Rocks. We Abound alſo with *Hot-Springs*, of which ſome are ſo *Hot*, that in a *Quarter* of an *Hour* they will ſufficiently *Boyl* great pieces of *Beef*; which is thus ordered: They hang the Kettles with Cold Water over them, in which they put the Meat to be *Boyled*; for fear of either Burning or throwing up the Meat by the Fervent and Vehement Ebullition of the *Hot-Waters*. Theſe Waters do Harden and *Petrifie* about the brims of the *Thermæ*.

Our *Higheſt Hills* are not above a *Quarter* of a *German Mile* High; which how I have Meaſured, I ſhall give an account of hereafter. There is a whole Ridge of *Mountains* through all the Iſland. Our People Live only in the Valleys, and towards the Sea-ſhore. There are other *Ignivomous* Mountains beſides *Hecla*; yet all Covered with *Snow*.

The *Declination* of the *Load-Stone* is here to the *Nord-Weſt*.

Our *Soil* is *Claie* for the moſt part; in ſome places, *Sandy*; no where *Chalky*. No *Tillage* at all; We are ſerved by imported Commodities, of which the chief are, *Barley*, *Wheat*, *Linnen*, *Iron*.

Touching *Animals*, We have great Number of Divers Birds in Summer: In Winter, *Ravens*, *Eagles*, *Wild-Ducks*, *Swans*.

We are pretty well ſtor'd with *Horſes*, *Oxen*, *Cows*, *Sheep*, *Dogs*, and in ſome places with *Hens*. *Foxes* there are in the Mountains; and when the *Greenland-Ice* comes upon us, that brings with them thoſe Terrible Gueſts, that do us ſo much miſchief, I mean, a great many *Bears*. Our *Oxen* and *Cows* Live in Winter upon *Hay*; but our *Horſe* and *Sheep* make a ſhift to Live upon the *Graſs* under the *Snow*, and the *Corallin-moſſe*, call'd *Muſcus Marinus*.

We have no *Minerals*, that we know; only ſtore of *Brimſtone*, of which we ſend out every Year 2 Ships Lading.

In the Year 1642. on the 13*th* of *May*, all the Sea, which beats upon our Promontories, was for 2 days ſo *Pellucid* and Shining, that Shells and the leaſt Stones could be ſeen at the *Bottom*, where the Sea was 40 *Fathoms* Deep, in ſo much that the ſaid Objects ſeem'd to be no further than 3 *Foot* diſtant from the ſides of our Fiſhermens Boats; who, when they ſaw it, were ſo Frighted at it, that they preſently came in, and noiſed this all over the Country. It began in the Morning about 9 of the Clock: and the whole is Witneſſed by divers very Honeſt and Credible Men.

A Summary Relation of the Diſcoveries about the North-East-Paſſage; *by*..... *n.* 118. p.417.

XXVII. It is ſufficiently known how Studiouſly and Solicitiouſly the Lords of the *United Netherlands* have Labour'd to Encourage thoſe that ſhould firſt Diſcover a more Compendious and Shorter Paſſage by the *North* to *China*, *Japan*, and other *Oriental* Countries. But thoſe who *Firſt* Adventur'd upon this Enterprize, found by Sad Experience, that the Succeſs anſwer'd not their Expectation and Hopes.

Thoſe who immediately *Succeeded* them in that Adventure, were not much more Succeſsful: for treading the ſame Steps that the Former had done, they were Involv'd in the ſame Difficulties; For they were all miſled by an Opinion, That that part of the Sea which lieth betwixt *Nova Zembla* and the Continent of *Tartary*, had been *Paſſable*, and that they might have Sail'd through that to *China*. But the Arm of the Sea, into which Men paſs through the *Streights* of *Weygatz*, is too ſtrongly bound up by the Froſt, eſpecially in the Winter-ſeaſon, Nor ought any Man to wonder, why the Navigation of *Will. Barentz* (otherwiſe a well experienc'd Mariner) was Unſucceſsful, who paſs'd along the *Coaſt* of *Nova Zembla*, as far as the 77*th* Degree of *Northern Latitude*: For it is well known to all that Sail Northward, that moſt of theſe Northern *Coaſts* are *Frozen* up many *Leagues*, though in the *Open Sea* it is not ſo: no, not under the *Pole* it ſelf, unleſs by Accident; as when, for Example, upon the approach of the Summer, the *Froſt* Breaketh, and the *Ice*, which was Congeal'd near 40 or 50 *Leagues* to the *Shore*, Breaks off from the Land and *Floats* up and down

Vid. ſup. Vol. 1. *Cap.* VIII. *Sect.* XXXIII.

down in the Sea; whereby ſeveral have been forc'd to Quit their Deſign, and ſtand back for their own Country.

There was, ſome Years ſince, a knot of Merchants of *Amſterdam*, who attempted thoſe Seas with much Better Succeſs than the former: For being advanc'd to the *79th* or *80th Degree* of *Northern Latitude*, they Paſs'd above an *Hundred Leagues* Above *Nova Zembla* toward the *Eaſt*. And, though they gave ſtrict Charge to Conceal what they had ſeen and obſerv'd, yet it became publickly known, that they had diſcover'd a Sea, beyond *Nova Zembla*, Free from all Ice, and very Convenient for Navigation.

Theſe being return'd to their own Country, with great Hopes of finding encouragement to make further Diſcoveries, Petition'd the Lords the *States General* of the *United Provinces*, That, ſince they had granted the Trade of almoſt all the World to the Governours of the *Eaſt* and *Weſt-Indian Companies*, and that there remain'd ſcarce any thing to the reſt of the Merchants, beſides the Trade of the *Mediterranean* and *Baltick Seas*, they would be pleaſed to Grant the Navigation of the *Northern Seas*, and of the *Eaſtern* (not yet diſcover'd) to them, Excluſive to the *Eaſt* and *Weſt Indian Companies*. But the Governours of the *Eaſt Indian Company* being ſenſible how nearly this concern'd them, preſented likewiſe their Croſs Petition, deſiring that the Petition of the ſaid Merchants might for the future be Referred to Them and Their Conſideration.

The Merchants finding their Petition thus Croſſed, Addreſſed themſelves to the King of *Denmark*, who immediately Granted their Demands. Under his Protection therefore they Equipp'd 2 or 3 Ships, ſuch as they judg'd moſt proper for this Voyage. Which when the *Governours* of the *Dutch Eaſt-Indian Company* had Information of, they Raiſed a Conſiderable Sum of Money, and eaſily perſwaded the Mariners to Deſiſt from ſo Dangerous (for ſo they repreſented it) a Voyage; and yet that the Merchants might have no juſt Cauſe to Complain againſt the ſaid *Company*, the Mariners went to Sea; but neglecting the Directions and Orders of thoſe Merchants, they Steer'd their Courſe directly for *Spitzberg*, took in their Lading of *Fiſh*, and return'd Home.

Upon which the *Eaſt-Indian Company* of the *United Netherlands* Omitted neither Study nor Care, to find out a Paſſage through the *North Eaſtern Sea* for thoſe that were to Return into *Europe* from the *Eaſt-Indies*. There was then much Diſcourſe of the *Gulf* of *Anian*, by which a Paſſage was ſaid to be open into the *Tartarian Sea*: and ſomething they underſtood from the People of *Japan* and the *Portugueſes*, of the Country of *Jezzo*, which lay above *Japan*. But not reſting ſatisfy'd with the bare Relation, in the Years 52 and 53 they ſent out ſome Dextrous Perſons to Diſcover thoſe Coaſts; who paſſing beyond *Japan*, in the *50th Degree* of *Northern Latitude* arriv'd upon the Coaſt of *Jezzo*, where they Fell into a Narrow Sea, yet Broad and Convenient enough to lead into the *Northern Ocean*. The oppoſite Shores they call'd *Het Compagnie Land*, and an Iſland ſeated in the middle of the *Gulf* they call'd *Het Staten Eyland*.

Whether this *Land* of *Jezzo* be Annex'd to *Japan* or not, the Inhabitants of both Countries Doubt, becauſe Vaſt and Inacceſſible *Mountains* interpoſe, which hinder the Communication. Neither doth it as yet clearly appear, whether this Land of *Jezzo* is a part of *Tartary*, or whether by an Arm of the Sea Divided from it. The *Chineſe* affirm, That *Tartary* runs 300 *China Leagues* Eaſtward beyond their Famous *Wall*: So that, if we follow theſe, the Country of *Jezzo* and *Japan* may ſeem to be Annex'd to *Tartary*. But thoſe of *Jezzo* ſay, That there Runs an Arm of Sea betwixt them and *Tartary*: Which Opinion may ſeem to receive ſome Confirmation from what theſe *Hollanders* affirm, who ſhipwrack'd (ſome Years ſince) upon *Corea* a *Peninſule* of *China*; they ſay, They ſaw there a *Whale*, upon whoſe Back ſtuck a *Harping-Iron* of *Gaſcony*. And the Credit of this Aſſertion not being queſtion'd by any, it is moſt probable to be conjectur'd that this Whale paſs'd from *Spitzberg* thorough the Neareſt Arm of the Sea, rather than through the more Remote. Be it how it will, we may hence ſafely conclude, that the Sea which lies beyond *Japan* and *Spitzberg* is *Paſſable*; and that through more perhaps than One Arm or Channel by which they Communicate.

But to go on: After the Experiments made by the Governours of the *Eaſt-India Company*, in the *Years* 52 and 53, they reſolved to proceed no further upon the Diſcovery; as well becauſe the Emperour of *Japan* Interdicted the Navigation of Forreigners into *Jezzo*, in regard (as they ſay) of the vaſt Tribute which he Raiſeth annually upon the *Silver Mines* there, as becauſe they think, it may little Conduce to their Advantage, to have this compendious way of Navigation diſcovered. And therefore they have thought fit to *Prohibit* all farther Search into the Navigation to *Jezzo*, and the Countries Adjacent: upon which very reaſon they have alſo endeavoured to Conceal their *Auſtral Plantations*.

Now concerning that Tract or Space which lieth betwixt *Spitzberg*, *Nova-Zembla*, and the *Streights* of *Jezzo*, we have no reaſon, for Ought I ſee, to Entertain any doubt; becauſe many of the *Muſcovite* Itinerarys Aſſure us, that the Coaſt of *Tartary* runs not *Northward* from *Nova Zembla*, but turns up very much towards the *Eaſt*; ſo that the Head-land of *Nova-Zembla* is far the moſt *Northern* part of all *Tartary*. This may likewiſe be collected out of the Hiſtories and *Maps* of *China*, which Affirm, that thoſe which paſs from the *Wall* of *China* Northward, may in the Space of 14 *Days* reach the *Sea*. And the Coaſt of *Tartary*, which lies beyond the *Samojeds*, ſufficiently Teſtifieth the Neighbourhood of the Sea, for as much as the farther any Man advanceth towards the *Eaſt*, the *Muſcovites* have there obſerved Large and Navigable Rivers, and Fair Cities abounding with Plenty of all manner of things.

It remains now, that we ſhould, enquire by what Courſe, and in what Seaſon of the Year this Voyage is chiefly to be Undertaken? It is hardly to be Doubted, but that the *Straight* which lies betwixt *Spitzberg* and *Nova Zembla* may be Paſſed; and the *Courſe* is to be directed to 78, 79, and even to the 80*th Degree* of *Northern Latitude*. If any Man ſhall, holding the ſame

ſame Courſe, proceed farther, he will find the Paſſage ſhorter; for, if we draw a Line to paſs from our Seas through the 78*th.* or 79*th. Degree* of *Latitude* to the *Streight* of *Jezzo*, it will be very near a Straight Line: But if any would from the ſame *Degree* of *Latitude* (having paſſed *Nova-Zembla*) Chuſe to Decline toward the Coaſt of *Tartary*, and Coaſt along by it till he meet with ſome *Streight*, he would find his Courſe ſomewhat Longer, but peradventure ſafer and better; ſince many *Streights* would Seaſonably preſent themſelves to him; and he might ſafely neglect the Meaſure of *Longitude*, which in Open Seas (and eſpecially thoſe that are near the *Pole*) is found Difficult to be obſerved. Neither ought this to be any hindrance, but that the other may be frequented; for, though in Places near the *Pole*, the Moments of *Longitude* have great Variety in a Little Space; yet there ariſeth not any great Difficulty from thence; ſince the Fault may more eaſily be Rectify'd in Leſſer Circles: For the Errour cannot be very Great, which falls out in *Longitudes* ſo much contracted.

As to the *Time* of the *Year*, wherein this Navigation ought to begin; it may be conſider'd Two ways. In the beginning of the Spring, *viz.* in the Month of *March*, it is Confeſs'd by moſt Men, that the Winds and Seas are favourable to thoſe that Sail to *Spitzberg*, and the Places near the *Pole*, and that they may Run all that Courſe from theſe Parts in 12, or 13 *Days* ſpace: but when they have Paſs'd ſo far, if any Man would deſign to Sail to the *Streights* of *Jezzo*, he muſt Steer his Courſe towards the *South*: But then theſe Motions of the Winds and Seas, which were Favourable to thoſe who Sail'd *Northward*, will be Contrary to thoſe who ſtand *Southward*, and they may long enough expect Northern Gales, which ſeldom Blow till towards the latter end of *Summer*, *viz.* in the Month of *Auguſt*. If therefore any Man would contrive to diſpatch his Voyage in the ſhorteſt Time, it were his ſafeſt Rule to make choice of that *Time* of the *Year*, wherein he might Sooneſt make to *Spitzberg* to and again, which I conceive would be in the *Beginning* of *Summer*; yet it would be Safer to ſet out Sooner, if the Wind permit. And although this Courſe ſhould Happily Succeed, it follows not, that I ſhould adviſe them to obſerve the ſame in their return homeward; for, things of that Nature muſt be left to the Prudence and Conduct of diſcreet Pilots and Mariners; who are yet to be advertiſed, that, ſince the greateſt part of this Navigation is to be ſought through unknown Seas, they ſhun, as much as in them lyeth, all near *Approach* to the Coaſts and Iſlands which they ſhall encounter, for fear of the *Ice*; and that they may always make choice of the moſt Open Seas, which are leaſt Infeſted with it, and in which the *Colds* are moſt *Moderate*. For, Experience hath ſufficiently taught, that whole large Seas are never known to be Frozen, but the Borders of the Seas near Land only, and theſe by reaſon of the Plenty of *Freſh Waters* that run into the Ocean, or the *Snows* Melted in it. And the ſame Experience hath taught, that there is not that Danger from the Fluctuating *Ice*, as is vulgarly apprehended, eſpecially in Seas not ſubject to violent Storms, and within the 6*th* or rather the 8*th* Month of the *Year*.

When

When the Nature of this Sea and of its ſeveral Streights ſhall be more perfectly diſcover'd, it is not to be doubted, but that the whole Voyage betwixt *Us* and *Japan* may be perform'd in the ſpace of 5 or 6 *Weeks*, at the moſt. But in caſe it ſhould either by Accident or Groſs Error, ſo fall out, that the Ships ſhould be forc'd to *Winter* there before they could recover Home, this likewiſe might be done without much Danger; provided that they Avoided the Unadviſed Proceeding of the *Dutch*, who being Caught, and neceſſitated to paſs the *Winter* in the moſt *Northern Climates*, Planted themſelves there upon the Higheſt Lands, in Huts fram'd of Thin Boards (whereas in *Lapland* it ſelf it is Impoſſible to Live ſo:) but they Ought to Sink their Houſes Under-Ground, and to Heap much Earth over them; ſince 'tis not Poſſible, or, at leaſt, extreamly Difficult for Men to Subſiſt in ſuch an exceſſive Severity of *Winter*, unleſs they Neſt themſelves under the Earth.

Obſervations in two Voyages to the East-Indies; by Mr. Rich. Smithſon. n. 50. p. 2003.

XXVIII. From *England* to *Cape Finis Terræ*, in 44 *Deg. N. Lat.* The *Bay* of *Biſcay* is ſubject to Storms, and the Sea Rough, and the Waves running very High.

From thence to 34° The *Wind* is *Variable*: but if you be within 100 *Leagues* of the *European* Continent, it is generally enclin'd to *North-Eaſt*.

From 34 *Deg.* if you be inclining for the Coaſt of *Africa*, or about the Meridian of the *Canaries*, the *Wind* is ſo *Certain*, and conſtantly at *North-Eaſt* (or within two *Points*) that it is Rare to find it otherwiſe. Yet in *Winter*, upon the Coaſt of *Africa* there are ſometimes *Weſterly Storms*, that are Violent, but of no long Continuance: And in *Summer* when it is ſometimes Calm, the Air will come *Variably*. Theſe *North-Eaſt-Winds* hold moſt commonly to 8°. *North Lat.* and then begin the *Tornado Winds*, which are moſt part Confin'd between 8°. and 4°. *North-Latitude*; They are ſeldom or never more *Southerly*: but on this ſide the *Line* they have ſometimes been met between 11 and 12°. *North Lat.* Theſe *Tornadoes* are *Uncertain Winds*, blowing from all *Points* of the *Compaſs* in the ſame Hour, and ſometimes the Wind *Shifts* thus without being *Intermitted*, and otherwhiles it will be ſtark Calm, almoſt between every Puff. They are ſo Confuſed, that let 4 or 5 Ships Sail together as near as is fitting for Ships that keep Company, at the ſame inſtant many times every Ship ſhall have a *Several* and *Contrary Wind*. And this Place is almoſt always Infeſted with Horrible *Thunders*, *Lightnings* and *Rain*. And the Nearer you are to the *Africk* Shore, ſo much more dreadful is the *Thunder* and *Rain*: but the further *Weſtward* you go, the *Thunder* and *Rain* will be Leſs, and the *Wind* not ſo *Uncertain*; ſo that if you go as far *Weſt*, as the Meridian of the *Eaſt-ſide* of *Braſil*, there is little *Thunder*, neither doth the *Wind* come down in ſuch Puffs and *Flaws*; but between 4 and 8°. it is moſt inclin'd to *Calms*, and very great and thick *Fogs*, and the *Rains* come not in ſuch Violent Showers.

Likewiſe

Likewiſe this is a ſure Rule, that near the *Africk-Shore*, and ſo for 100 or 200 *Leagues Weſt*, the *North-Eaſt-Winds* commonly incline more and more to the *Eaſt*; ſo that by that Time, you come to the *Weſt* of the Meridian of the *Azores* but 20°. the *Trade* or *Conſtant Wind* will be moſtly *E. N. E.*

Now as from 34°. to 44°. near the Continent of *Europe*, the *Winds* are commonly between *E.* and *N*; ſo after you come ſo far *Weſt* as the Meridian of the hithermoſt of the *Azores*, they are commonly between *S. W.* and *N. W.* And for this reaſon, Ships that are Outward Bound to the *Streights*, keep near the Coaſt of *Portugal*, but Homeward Bound they are many times forced to Run far *Weſt* to fetch a *Weſterly Wind*. Likewiſe Ships Bound to the *Barbadoes* go by the *Canaries*, but come home a great way to the *North Weſt* of the *Azores*. And the *Virginia* Ships are Twice as long in Going Out, as they are in Coming Home, and many times Longer: for they come Home before the *Wind* directly, but go Out round about as far as the *Tropick*, or at leaſt 28°. *Lat.* for the beneſit of the *North Eaſt-Wind*; and when that hath carry'd them far *Weſt*, they come back to the *Northward* again: and then as the *Weſterly Wind* hangs more or leſs *Southerly*, they have a Good or Bad Paſſage.

Between 3 and 4°. *Northern Latitude*, the *South-Eaſt-Wind* begins to take place between the *Æquator* and the *Tropick* of *Capricorn*: But the nearer you are to the Coaſt of *Africa* it is ſo much more *Southerly*; and as you approach to the Coaſt of *Braſil*, it inclines more and more *Eaſterly*. And there is not only a *Variation* in the Wind in reſpect of *Longitude* but alſo in reſpect of *Latitude*: for near the *Æquator* the *Wind* is more *Southerly*, than it is in the ſame Meridian near the *Tropick* of *Capricorn*. As for Example, in the great *Bay* of *Guinea* (which our Seamen call the *Bight* of *Guiney*) the *Wind* (as I have been credibly informed) is moſtly *South*; and inclines as much to the *Weſt* as to the *Eaſt*: but in the ſame Meridian near the *Tropick* of *Capricorn*, I am ſure it is conſtantly berween *S. E. b. E.* and *S. E. b. S.* And on the contrary in that Meridian, which may be about 100 *Leagues* to the *Eaſtward* of *Braſil* near the *Æquator*, the *Wind* is between *South Eaſt* and *Eaſt South Eaſt*; and in the ſame Meridian the *Winds* near the *Tropick* are more *Variable*, but moſt part about *North Eaſt*. In our latter Voyage from the *Line* to the *Tropick* of *Capricorn* we had many *Calms*, and what *Winds* we had were very ſmall, which was in the latter half of *April* and the former half of *May*, but in our *Firſt* Voyage in the latter half of *May* 1657. great *Storms*. The *Stormy* Days were *May* 16, 17, 18. eſpecially the 17 in 7 *Deg. Southern Latitude*. Alſo the 20 and 21 in the *Lat.* of 12°. and 13°.; and the 27*th* at Night in *Southern Lat.* of 22°. which *Storm* was the moſt ſuddain and unexpected that ever I ſaw: for all Day it was very Fair Weather, and ſo till 8 at Night, and the *Wind* at *North Eaſt*, but on a ſudden came a Violent *Storm* of *Wind* at *South-Weſt*, and in a Moment the whole Heavens were become Black and prodigiouſly Dark, which continued till 4 the next Morning,

ing, with Intolerable *Rain*; and then the *Wind* came again at *North East*, and it was presently *Fair*.

Near *Africa* the *South-East Winds* hold to 28°. or 29°. *Southern Lat.* but towards *Brasil* from the *Tropick* of *Capricorn* to 32°. they are *Variable*, and to the *Southward* of 32 *Westerly*; as you may perceive by this following Account. *May* 29 *Lat.* 24. 27′. *Longit.* (by the *Plain Sea-Chart*) from the *Lizard* 11°. *West*; *Variation* 10°. 7′ *East*: *Fair Weather*; the *Wind* from *S. W.* to *W.*

Jun. 1. Little *Wind*, at *S. W.*

Jun. 2. *Lat.* 26°. 0′. *Calm* all day, and a great *Storm* all Night at *South.*

3. Strong *Wind* at *S. S. E.* At 1 at Night it came to *E. b. S.* and Blew with the same Violence till next day Noon.

4. *Lat.* 26°. 15′ *South. Longit.* from the *Lizard* 9°. 24′. *West*: the *Wind* moderate at *E. b. S.*

5. *Lat.* 27°. 32′. a Fresh Gale at *E. b. N.* Dark and Cloudy but no *Rain.*

6, And 7 the same.

8. Dark Day and *Calm* all Day and Night.

9. *Calm* till Midnight; then a Little *Wind* at *N. W.*

10. *Lat.* 32°. *Calm* all Day, and till Midnight; then a Fresh Gale at *N. W.* This Day we saw a great Number of Whales sporting themselves.

11. *Lat.* 32°. 43′. The first Clear Day we had in a Fortnight. Strong *Wind* at *N. W.*

12. *Lat.* 33°. 44′. *Long.* 5°. *West. Variation.* 9°. 40′. *East. Clear* Weather, till the latter end of the Night; then it *Rained*: Strong *Wind* at *W. N. W.* and a smooth Sea; so that we Sailed this Day 177 Miles; the most that our Ship Sail'd in 24 Hours in all the time of the Two Voyages, that I Sail'd in her.

13. *Lat.* 34°. 15′. *South. Longit.* 2°. 7′. *West* Violent Wind. At 4 *p. m.* it Shifted suddenly from *W. N. W.* to *W. b. S.* At 10 at Night to *S. W. b. W.* after midnight, to *S. W. b. S.* about 4 to *S. S. W.*

14. Very great *Wind* at *S. S. W.* About Midnight it Shifted to *W.* and immediatly followed a very Terrible *Storm* of *Wind* and *Rain*, and a great over-grown *Sea.*

15. At 7. in the Morning the Wind came back again to *S. S. W.* the whole Day was a very Dreadful *Storm* of *Wind.* At Noon (by accompt) we were in 34°. 42′. *South Lat.* and 3°. 20′. to the *Eastward* of the Meridian of the *Lizard*, The *Sea* was exceedingly Rough. At 4 *p. m.* fell a great *Storm* of *Hail.* At Night was a great *Eclipse* of the *Moon*; she begun to be *Totally Dark* about *half* a *quarter* past 8, and began to *Recover* some of her *Light* 2 *Minutes* before 9; as we reckoned the Time by our *Glass.*

16. A Little before Noon the *Wind* came to *West* and continued a strong Gale but with Fair Weather.

17. *Lat.*

17. *Lat.* 35°. *South. Longit.* (from the *Lizard*) 7°½. *East. Variation* 2°. 30'. *East.* We saw many great heaps of *Weeds* in the Sea, and a great Rolling Sea came out of the *South.* A strong *Wind* (without Gusts) all this 24 Hours at *W.*

18. A very strong *Wind* at *West.* We sailed 170 Miles.

21. Was the first *Clear* Day we had this Month. *Latit.* 35°. 40' *South. Longit.* 17°. 40'. *Eastward,* from the *Lizard. Variation* 1°. 4'. *West.* The Wind at *North-West* till 4 p. *m*; then it came to *West* with a Thick Sky and Cold *Rain.* At 8 to *W. S. W.* At 3 in the Morning to *S. W.* and at 6 to *S. S. W.* At 9 the next day to *South*; all strong *Winds.*

22. Dark and Cloudy. At 2 of the Clock the *Wind* came to *S. S. E.* At 4 to *E. S. E.* At 10 to *East*; and there continued till the 24*th* in the Morning; which all accounted very Strange.

24. In the Morning it fell *Calm,* and was pretty *warm,* having been bitter *Cold* the last 10 *Days.* At 3 a Clock in the Night a Fresh Gale at *N. N. W.*

25. *Lat.* 36°. 10', *Long.* 21°. 25' *Variation* 3°. 40'. *West.* Fair Weather. *Wind N. N. W.*

26. A Clear Day *Wind N. N. W. Variation* 4°. 30'.

27. In the Morning *Calm*; about 9 *Wind* and *Rain* out of the *S. W.* At Night *Calm* and *Fair.*

28. A Fair Day, and most part *Calm.* At 10 at Night, *Heaving* the *Lead* we had *Ground* 130 *Fathoms*; the *Sand* like *Calais Sand.* The *Variation* was 7°. 10'. This was off *Cape Aguthas*, the most *Southerly* Land of all *Africa,* lying 90 *Miles E. S. E.* from the *Cape of good Hope.*

In our *Latter* Voyage, after we came to 32°. *South Latitude* (to which Place from the *Line* we were much *Becalmed*) we had Fair Weather, and a *Constant Wind* between *W. N. W.* and *W. S. W.* all along to the *Cape*; (and so it is most commonly:) I have therefore Noted the *Weather* in the Former Voyage, because it was *Unusual*; in that Vast space between *Riode la Plata* and the *Cape* the *Wind* being all the Year *Westerly.* But about the *Cape* from the End or Middle of *Sept.* to the Beginning of *April,* the *Winds* are *Variable* as in *England.* The Rest of the Year they are *Westerly,* and Intolerable *Storms.*

I can give you no Account of any thing to the *Southward* of 37 *Degrees*; those Few Ships, that have adventured to 38°, reporting the *Winds* and *Seas* so Raging, that none Dare go Further.

XXIX. 1. The greatest length of Time, that *Pearl-Divers,* in these Parts, can hold *Under Water,* is about a *Quarter* of an *Hour*; and by no other means but Custom: For *Pearl-diving* lasteth not above 6 *Weeks,* and the *Divers* stay a great while longer *Under Water* at the End of the Season, than at the Beginning. Here at *Batavia* is an expert *Diver,* who draws wages for nothing else but for *Diving* for Anchors, Guns, *&c.* lost in the Road. I have seen him several times go down, holding my Breath as long as I could, but he stayed 10 *times* as long *Under Water* as I could hold my Breath.

Observations the East by Sir Pl natti. n. 43.

But he will not go down unleſs you give him a whole *Pint* of *Strong-water.*

2. The *Oyl* drawn out of the *Roots* of *Cinamon* Trees, and Reſembling *Camphir*, is thence Extracted, the *Roots* being Dried, Bruis'd and ſteep'd in Water, and then Drawn over by an *Alembec.*

3. The *Lignum Aloes* is part of a *Living* Tree, but commonly found, when 'tis *Withered.* The Tree it ſelf is of a White Soft Wood, giving a *Milky* Juice, which is ſo *Venemous* withal, that if in cutting the Tree, any of the *Milk* light in your Eye, you grow Blind; if on any other part of the Body it becomes Scabby, and Noyſomely Sore. The *Lignum Aloes* or *Calambac*, is found within the White Wood, but not every where. When the Tree Decays, the White Wood ſoon Withers, and grows Worm-eaten; and the *Milk* ſo dries up, that you may eaſily rub it aſunder with your hand. The beſt is found in the midſt of the Tree, Nouriſhed by the *Heart-Root*, which goes ſtraight down into the Ground.

4. The *Wood*, *Stinking* like *Humane Excrement*, grows thus naturally in the Iſles of *Solor* and *Timor*, and thereabouts.

5. There are indeed ſuch *Serpents* in theſe parts, which have an *Head* on each End of their Body, call'd *Capra-Capella.* They are eſteem'd *Sacred* by theſe People, and Fortunate to thoſe in whoſe Houſe and Lands they are Found; but Pernicious to whomſoever doth them Harm.

Obſervations in the Eaſt-Indies; *by* ..... n. 243. p. 273.

XXX. It does not appear that the *Maldiva* Iſlands were ever joyn'd to the Main Land, there being no *Soundings*, as they call it, between the Iſland and the Main, and the Earth, Sand, and Shells, of the one much Differing from the other: the ſmall Shells, call'd *Cowries*, which paſs for *Money* in *Bengal* and other places, are chiefly found there.

The *North* and *South Poles* are not Viſible under the *Line*: for in the Cleareſt Night the *Horizon* is Overcaſt with a Thick Mighty Darkneſs, that no *Star* can be Seen.

Gum-Lack is the Houſe of a large ſort of *Ants*, which they make on the Boughs of Trees, which ſerve to keep them from the Weather, *&c.*

'Tis certain that *Cloves* will *Attract* Water at ſome diſtance; which is dayly Experienc'd amongſt the *Dutch* in this Country, who make a conſiderable Advantage thereby. I have known a Bag of *Cloves* laid over Water One or Two Foot Diſtant, which has in a Night's time *Imbibed* a conſiderable Quantity of Water, and grown ſo Moiſt that the Water might be Preſs'd from them.

There has been an *Oyſter-ſhell* in *Bantam* that has been about 18 *Inches* Diameter, and ſeveral in *Maccao* that have been 18 *Inches* Long, and 5 or 6 *Broad*, whoſe *Meat* within has been proportionable to the *Shell.*

I am well Inform'd by the Perſons that did ſee it, that at *Batavia* a Whole *Duck* was taken out of the Belly of a *Snake*; and that in *Achin* they did kill a *Snake* that had a whole *Deer* in its Belly, which they took out being Freſh and Good, and that they did Dreſs and Eat part of the *Deer.*

They

They Draw their *Wire* in Moulds of ſeveral Sizes, gradually as we do.

The *Chineſe* Gild Paper with *Leaf-Gold* and *Silver*, laid on with a very good ſort of *Varniſh* they have, which is the ſame wherewith they *Varniſh* their *Lacker'd Wares*; all which, after it is throughly Dry, they put in a Screw-preſs, and with an Inſtrument like our *Plain*, Shave it as Fine as they pleaſe; and ſo they Cut their *Tobacco*, which is as Fine as a Hair.

Amber-Greaſe is found more or leſs in moſt Parts; great Quantities are found at *Japan*, and to the Eaſtward of *Java*, and at *Maldiva* Iſlands; which, they ſay, they find generally faſten'd to the *Roots* of *Trees* that grow in the Sea near the Shore; and that while it is kept Under Water 'tis Soft and Pliable like Wax, and ſometimes like Gelly: There is now a Piece in *India*, which I have ſeen, that Weighs above 2000 *Ounces*.

The People of *Java*, Marry, and have *Children* at 9 or 10 *Years* of Age; and generally leave *Child-Bearing* at or before 30. At *Tunquin* there are Women Common to any that will Hire them, at 8 or 9 *Years* of Age.

The *Japan* and *China-Varniſh* is made of *Turpentine* and a Curious ſort of *Oyl* they have, which they Mix and Boil to a convenient Conſiſtence; which never cauſes any *Swelling* in the Hands or Face, *&c.* of thoſe that Make or Work it. The *Swelling* that often happens to thoſe that Work the *Lacker'd Ware*, and ſometimes to thoſe that Paſs only by the Shops and look on them at Work, is from the *Lack*, and not the *Varniſh*; which *Lack* is the *Sap* or *Juice* of a *Tree* which runs out ſlowly by Cutting the Tree, and is catch'd by Pots faſten'd to the Tree; 'tis of the Colour and Subſtance of *Cream*; the Top, that is Expos'd to the Air, immediately turns *Black*, and the way that they make it *Black* and fit for Uſe, is to put a ſmall Quantity into a Bowl, and ſtir it continually with a piece of Smooth Iron for 24 or 30 *Hours*, which will both Thicken it and make it *Black*; to which they put a quantity of very fine Powder of any ſort of Burnt Boughs, and Mix it very well together, and then with a Bruſh lay it Smooth on any thing they deſign to *Lack*, then let it Dry very well in the Sun, which will then be Harder than the Board it is laid on; when it is throughly Dry you muſt Rub it with a Smooth Stone and Water till it is as Smooth as Glaſs, and on that lay your *Varniſh* made of *Turpentine* and *Oyl*, Boil'd to a due Conſiſtence, for *Black-Lack*: but if you would have *Red*, or any other Colour'd *Lack*, you muſt Mix your Colour in Fine Powder with your *Varniſh*, and take care to lay your *Varniſh* on as Smooth as poſſibly you can, for therein lies the Art of *Lacking* well. If you would Paint in *Gold* or *Silver*, &c. you muſt with a Fine Pencil dip'd in the ſaid *Varniſh*, draw what Flowers, Birds, *&c.* you pleaſe, and let it lie till it begins to be Dry; then lay on your *Leaf-Gold* or *Silver*, or *Pin-Duſt*, &c.

It is well known that there is amongſt the *Bramines* a Language call'd the *Sanſcreet*, writ in a different *Character* from what is now in Uſe; in which Language are written the *Porane*, or Sacred Hiſtory; the *Shaſtram*, being to them what the *Bible* is to *Chriſtians*; and the *Four Beads*, (whereof one is loſt) containing their *Divinity*, *Law*, *Phyſick*, &c. and ſome other Books. This Language is not underſtood by all *Bramines*, but only by the

the Studious and Learned among them. I ask'd one of the moſt Eminent among them in this Place, how long it was ſince the ſaid Language was Loſt; who anſwer'd, that it was ſpoke in the Age of the Gods, or when they Liv'd upon Earth; which by their Calculation continu'd many Thouſand Years, and Ended ſo many Years paſt, as we reckon from the *Flood*, or thereabouts: but they have little knowledge in *Chronology*. It is Evident that ſeveral of the Languages now ſpoke in *India*, are deriv'd from the *Sanſcreet*, and one of the *Bramines* writ a Book to ſhew that the preſent *Hindoſtan*, or Language ſpoken by the *Moors*, in particular, is deriv'd from thence.

I have enquir'd of Two of the moſt knowing *Bramines* in this Town, and they both Agree, that our *Sunday* in every Week was a *Holy-Day*, or Day of Reſt, with them, and for fear they ſhould abuſe me, I have ask'd a *Mowla*, or Mahometan Prieſt, a Native of *India*, and one that always Liv'd amongſt them, and he gave me the ſame Account. Beſides this, they have their *Monthly Holy-Days*, for the 8*th Day* after the *Change* of the *Moon* is always a *Day* of *Devotion*, as alſo the 14*th*; and the 11*th Day* from the *Change*, a ſtrict *Faſt*, call'd *Jaka Daſee*, or *Yaka Daſee*; ſo likewiſe the 8*th Day* from the *Full-Moon*, and the 14*th* are *Days* of *Devotion*, and the 11*th* a *Yaka Daſee*, Beſides theſe, they have throughout the Year ſeveral *Feſtival-Days* and *Times*, as in other *Religions*.

Upon the *Death* of any Perſon, the next of Kin, eſpecially a Husband for a Wife, a Father for a Child, *& vice verſa*, as alſo a Brother for a Brother or Siſter, Deceas'd, do *Mourn* 15 *Days*, during which time they Eat only Rice and Water, and are not either to Eat Betle, or Mark their Foreheads, but uſe ſeveral Waſhings, and variety of other Ceremonies; as carrying Victuals to Gardens, Groves, and Tanques; to Diſtribute, and make ſeveral Prayers that God would Grant the Deceas'd Party a good Place in the other World, Forgive him his Sins, be Favourable unto him, *&c.* and upon the 16*th Day* they make a *Feaſt* to all their Friends and Relations and thoſe of their own Coaſt, as they are able, and likewiſe *Yearly* upon the *Day* of his Death they give *Alms*; *i. e.* Victuals to more or leſs Poor People, as they are able, with whom they make Prayers for the *Dead*.

Obſervations in Japan; by M. ..... n. 49. p. 983.

XXXI. 1. The *Japoneſe* doubt not at all of their Country's being an *Iſland*, though it be ſeparated from the *Continent* by ſuch Narrow Channels, that no Veſſel of any conſiderable Burthen can paſs them.

2. The *Air* is very *Salubrious*: but of another Temper on this, than on that ſide of the *Mountains*, which divide *Japan*. The *Plague* hath never been heard of there: but the *Small Pox* and *Fluxes* are very frequent.

3. Their *Mountains* are Fertile almoſt to the very Top.

4. There are found almoſt all *European* ſorts of Fruit: *Peaches*, *Apricocks*, *Cherries*, *Prunes*, *Apples*, *Pears*; and partcularly *Pippins*, *Bon-Chretien-Pears*. Beſides theſe there is an infinity of other Fruit: but almoſt none, but what is found in ſome part or other of *India*.

5. *Silver*

5. *Silver* is there in its higheſt Perfection, but not Uſed in Trade; in which is ſeen nothing but *Gold*, and ſome ſmall *Coyn* of *Braſs*; which Latter they ſpoil by Refining it too much. *Steel* alſo is there very Good.

6. The Temper of their Metals was formerly better than 'tis now: but yet they make *Courtelas*'s, or ſhort Swords, exceeding Good.

7. The great *Mountain* of *Japan* is Higher than the *Pico* in *Teneriff*, ſince being above 18 *Leagues* Diſtant from the Sea-Side, it may be ſeen above 40 *Leagues* off at Sea. There are 8 *Vulcans*, or *Fire-Spitting Mountains*, in *Japan*; and you cannot go into the Campagne, but you diſcover one or other of them.

8. There are many *Medicinal Waters*, and *Hot-Springs*, which the Inhabitants Uſe in their Diſtempers. They have particular Medicines; but they *Let no Blood*. They make much uſe of *Cauſticks*, by applying upon ſome *Nerve* or other the Powder of *Artemiſia*, or *Mugwort*, and *Cotton*, which they ſet on Fire. They always Drink their Liquors Warm.

9. There is ſo great a ſtore of *Veniſon* in *Japan*, that they care little for Cattle; though there be not Want of them. They employ moſt *Oxen* for Ploughing: and they make no Butter nor Cheeſe; nor are they Lovers of Milk. They have great Plenty of *Corn* and *Rice*.

10. The *Japoneſe* are Proper enough of *Stature*, and not uncomely in *Features*; They have ſomewhat prominent Bellys; They are exceeding Active and want no Judgment; they are alſo Military and Valiant.

11. No *Arts* are to be met with amongſt them, that are not known in *Europe*, except that of making *Lacca*; of which there is ſome ſo fine and Curious, that whereas in this Country one may buy an ordinary ſmall Box for 3 or 4 *Crowns*, one of the ſame ſize, when made in *Japan* of Exquiſite *Lacca*, will ſell for more than 80 *Crowns*. The Author of this Accompt hath 4 *Cabinets* of this Workmanſhip, which he Affirms to have Coſt him above 40000 *Crowns*, which he will not Sell under 80000 *Crowns*.

12. The *Colours*, with which they *Dye* their Stuffs, never Fade: I have ſeen one of them, which our *Vermilion* and *Couleur de feu* come not near to. It is Extracted out of a Flower, like to *Saffron*, and *one pound* of it Coſts an incredible Price. To try whether the *Colour* will not Change by *Lixivium*, or *Lye*, they apply an Hot Iron to it: and if there it holds, they aſſure themſelves of the Durableneſs of the *Colour*.

13. They have *Mathematicians* amongſt them, and believe *Judiciary Aſtrology*, in ſo much that the Grandees undertake nothing without Preconſulting thoſe that make Profeſſion of the ſame.

14. *Japan* Yields Divers ſorts of good Merchantable Commodities; but chiefly all ſorts of *Silken-Stuffs*, *Unwrought Silk*, *Amber*, *Precious Stones*, *Musk*, *Copper*, *Steel*, *Lack-work*.

15. The Country is very well Peopled and exceeding Rich: but exceedingly ſtored with *Gold-Mines*: and I have ſeen ſome of the *Gold Ore*, which of 10 *Ounces* yields 8 of the Higheſt *Fineneſs*, and pieces of the Weight of 120 *Marks*.

16. Their

16. Their *Baildings* are very Good and Commodious. The Appartments are all below on the Ground, Separated from one another by Partitions of *Carton* Painted and Guilt, which may be folded and Removed like *Skreens*. Their Floors are covered with *Matts*, and ſometimes with *Silken Stuff*, embroidered *Velvet*, and *Cloth of Gold*.

17. They have no other Conveniencies to defend themſelves from *Heat* and *Cold*, but ſuch as are uſual in *Italy* and *Spain*.

18. They uſe the *Divertiſments* of *Comedies*, which are more Brave than thoſe of *Europe*. The Spectators are about 200 paces diſtant from the *Theater*, which being covered with a *Vault*, makes the Voice of the Actors to be underſtood to the very end of the *Theater*. They *Love Hunting*, and *Gaming*, as *Dice*, *Cards*, *Cheſs*, *&c.* At all times of the Day, and in all their Viſits they take *Tea* and *Tobacco*.

19. Their *Language* is altogether different from the *Chineſe*: but their Prieſts and Courtiſans, that is, the Learned amongſt them, which bear the Offices of the Court, underſtand the Tongue of *Cochin-China*, and by this means that of *Tunquin*, *China*, *Corea*, *&c.* They Write neither from the Right to the Left, nor from the Left to the Right, but *Downward*.

20. Their Government is *Deſpotique*; the Religion, *Pagan*; the *Chriſtian* Hated upon no other Account, but that ſome of thoſe, that there Profeſſed it, would perſwade the *Japoneſe* to acknowledge a Superiority above the Dignity *Royal*, Diſpoſing of Crowns and Scepters. Their *Morals* are very Good, their *Faults* being Puniſh'd as their *Crimes*; even *Lying* and *Detraction*. Their *Left Hand* is the more Honourable, and they take Horſe on that ſide.

Obſervations in Hollandia Nova; by M. Witſen. n. 245. p. 361.

XXXII. In a late Voyage to the *South-Land*, call'd *Hollandia nova*, it hath been Diſcover'd that the *Soil* of the Country is very Barren and as a Deſart; no *Freſh-Water Rivers* have been found, but ſome *Salt-Water Rivers*, as alſo no *Four footed Beaſts*, except one as great as a *Dog*, with long Ears, Living in the *Water* as well as on the *Land*.

Black-Swans, *Parrots*, and many *Sea-Cows* were found there, as alſo a *Lake*, whoſe Water ſeem'd to be *Red*, becauſe of the *Redneſs* of the Bottom of it: and round along the Shore there was ſome *Salt*. Our People ſaw but 12 of the *Natives*, all as *Black* as Pitch, and ſtark *Naked*; ſo Terrify'd that it was impoſſible to bring them to Converſation, or a Meeting. They Lodge themſelves as the *Hottentots*, in Pavillions of ſmall Branches of Trees. By Night our People ſaw *Fires* all over the Country: but when they drew near, the *Natives* were Fled. The Coaſt is very Low, but the Country far from the Sea is High.

Upon the *Iſland* near the Coaſt, were ſeen *Rats* as great as *Cats*, in an Innumerable Quantity: all which had a kind of a Bag or Purſe hanging from the Throat upon the Breaſt downwards. There were found many *Well-Smelling* Trees, and out of their Wood is to be drawn *Oyl Smelling* as a *Roſe*: but for the reſt they are Small and Miſerable Trees. There were alſo found ſome *Birds-Neſts* of a Prodigious Greatneſs; ſo that 6 Men could

could not, by ſtretching out their Arms, encompaſs one of them: but the *Fowls* were not to be Found.

There was great ſtore of *Oyſters*, *Lobſters*, and *Crabs*; as alſo of ſtrange ſorts of *Fiſh*.

There were alſo Millions of *Flies* very much troubling Men. They ſaw a great many Footſteps of Men and Children, but all of an *Ordinary Bigneſs*. The Coaſt is very Foul and Full of Rocks.

XXXIII. In *Brazil*, there are certain little Animals, call'd *Poux de Pharaon*, which enter into the Feet betwixt the Skin and the Fleſh; They grow in one Day as big as *Beans*, and if they are not preſently drawn out, they make an Unſupportable Ulcer, and all the Foot Corrupts.

Obſervations in Brazil and in Congo; by Mich. Angelo de Guattini and Dionyſius of Placenza. n. 139. p. 977.

In the Kingdom of *Congo*, there are Serpents 25 *Foot* Long, which will Swallow at once a whole *Sheep*. The manner of Taking them is thus: When they lie to Digeſt what they have Eaten, they ſtretch themſelves forth in the Sun: which the *Blacks* ſeeing Kill them; and having Cut off their Head and Tail, and Embowel'd them, they Eat them, and ordinarily find them as Fat as Hogs.

There are here a great Number of *Ants*, and of that Bigneſs that the Author, being one day Sick in his Bed, was forced to order himſelf to be carried out of his Room, for fear of being Devoured by them: As it often happens to thoſe of *Angola*; where you may alſo find in the Morning, the Skeletons of *Cows* devoured by theſe *Ants* in one Night.

Amongſt other Fair *Fruit Trees* in *Brazil*, there is one, whoſe Fruit is call'd *Niceffo*: which hath this remarkable, that it hath but *Two Leaves*; whereof each is able to Cover a Man.

XXXIV. *Oct.* 3. 1687. The King of *Feton*, *Ahen Penîn Aſhrive*, dy'd here at *Cape Corſe*; where he had been long Sick. The *Fetiſhers* had done all they could to ſave his Life, which was nothing at all to Purpoſe; Their *Phyſick* ſcarce extends to any thing but the *Flux*, and what we call the *French Diſeaſe*; his was a *Conſumption* and an *Aſthma*, of a great Continuance. So they fled to the Aid of their *Religion*, and according (it ſeems) to the Rules of that, they made ſeveral *Pellets* of *Clay*, which they ſet in his Room, in Rank and File, all *Sprinkled* with *Blood*; beſides the ſeveral Muttons which they Eat to his good Health. But that was of too little Force; ſo the Man Dy'd, having deliver'd his Sword to the *Dey*, who in the *Interregnum* was to be the Principal Man; for the Kingdom is *Elective*: and Commanded him to be conſtant to the *Engliſh*, of whom himſelf had been a great Favourer, with a Threat, if he was not, of Haunting him after his Death: He alſo appointed one of his *Wives*, whom he thought worthy of that Unlucky Honour, to accompany him to the other World. The next Day he was carry'd to *Feton*, and Bury'd there, *Nov.* 2. with the Poor Woman we ſpoke of. Preſently after, they that were conſiderable, or had a mind to ſeem ſo, ſent in them that they had a mind to Murder, in Honour of the King: how many there were 'tis hard to ſay, the Higheſt

Obſervations at Cape Corſe; by Mr. J. Hillier. n. 232. p. 687.

Account

Account gives 90, the Loweſt 50, the Middle 70: the *Blacks* do not underſtand *Arithmetick*, ſo the Numbers they give in all Caſes are very uncertain. I think there were about 8 from this Town, which will not hold Proportion to the Higheſt Rate; but 'tis like near *Feton* there might be more. They ſay alſo, that many more will follow at *Half a Year's* diſtance from his Death. The manner of the Execution of theſe poor Creatures, I have not yet learnt; only that they make them Drink and Dance, with a great deal of Bravery all the beginning of the Day, and toward Night Cut off their Heads: but whether by that they mean the common way of their *Executions*, I am yet to ſeek.

After the *King's Funeral*, the next thing was to chuſe a *Succeſſor*; ſo the People were call'd together at *Feton* (I ſuppoſe by the Authority of the *Dey*) without enquiring any thing of their *Freehold*; they pitch'd upon Mr. *Dey*, though he were not of the *Blood-Royal*; the Reaſon was, as they ſaid, becauſe he had *Power* enough to do what he pleaſed, and they could do nothing againſt him; but he refus'd the Honour becauſe of the Charge 'twou'd put him to, and propos'd the *Brother* of the *Deceas'd King*: ſo the Buſineſs ſtuck ſometime, but at laſt 'twas accorded, and King *Aſhrive's Brother* declar'd King, *Nov.* 18. His Name is *Ahenaco*.

The manner of their Ordinary *Executions* is thus: The Creature that is Condemn'd, is made to drink abundance of *Palm Wine*, and to Dance, every body that will, in the mean time Striking or Puſhing him: when that is over, as is ſaid, he is thrown down, his Face into the Sand, which whether it Stifle him or not, I can't tell, then his *Legs* are Cut off below the Knees, and his *Arms* below the Elbow; afterwards his *Thighs*, and his *Arms* below the Shoulder; laſtly his *Head*.

When any one has New *Drums* or *Trumpets*, 'tis neceſſary that they be Conſecrated with *Humane Blood*: I have known but one happen of this kind, which was *Jan.* 7. $168\frac{6}{7}$. when after a Man had been *Executed* after the Former Rate, about 8 in the Morning, at *One* in the Afternoon, they drank *Palm-Wine* out of the Upper part of his *Skull*, and this in the Sight of all the *Factors* at *Cape Corſe*.

The *Shore* lies almoſt *Eaſt* and *Weſt*, expos'd to the Sea wholly upon the *South*; the Country is *Hilly*, the Hills not very High, but Thick, Cluſtering together, the Valleys between extream Narrow; the whole in a manner cover'd with certain *Shrubs*, Low but very Thick; what the People *Till*, comes not to above a Tenth part of their Ground; and where they do *Till*, it Hinders not that within *Half a Year* the Ground is Overgrown as before; for they do not Root up the *Shrubs*, but only Cut, and ſometimes Burn them ſomewhat cloſe to the Earth, ſo they Spring again in a very little time; this is ſufficient for Planting their Corn, which they do by making little Holes in the Earth at a competent Diſtance, and putting Seeds into them.

It may be that if thoſe *Shrubs* were Deſtroy'd, the *Unhealthineſs* of the *Place* might be mended: which yet is not to be Hop'd for, but by bringing the People to ſome kind of *Induſtry*; and that will not be eaſy, they are

ſo

ſo wholly given to Lazineſs, and ſo entirely Bred up in it, that there muſt be the greateſt Change Imaginable, before they become any whit Tolerable. A Man may ſee their Temper by this, that though their *Tillage* be very Eaſy, and the Earth yields many Hundreds for one, yet ſo little is the Uſe they make of it, that one Scarce Year brings them to Danger of Starving: and though there be People enough, and every Man has Power of Chooſing what he will, that is not already *Till'd* by ſome other, yet not the *Tenth* part, as we have ſaid, is Imploy'd; So that a Man would Wonder what came in the *French Man's* Head to fancy them Induſtrious. But *Subtile* they are, and Diligent to *Cheat* any Man that is not Cautious enough to avoid it.

So that the *Fault* of the *Wood* is (by the Lazineſs of the People) without any Remedy. But there may be ſomething in the *Earth* it ſelf; the Water which they have here in *Pits* (Rain water for the moſt part, but yet Strain'd through the *Earth*) has a kind of Taſte mixt of *Sweet* and *Subacid*, if I underſtand what I ſay, I am told 'tis of *Vitriol*, whether that be miſchievous, you know better than I do; but I take this for certain, ſince I have had it from good Hands, that at *Whiddah*, which is one of the moſt *Unhealthy Places* in *Guiney*, but 'tis not upon the *Gold-Coaſt*, he that Opens the *Ground*, though it be but to dig a Grave, runs the hazard of his Life: ſo Miſchievous are the *Steams* from thence ariſing. It's poſſible there may be ſome ſuch *Steams* Here, only not ſo Violent; though in *England*, I think a *Gravel* or a *Sand* (which Here are always Uppermoſt for as much as I have ſeen) are eſteem'd very Wholſome *Soils*; under them is a kind of *Whitiſh Marle* almoſt like *Fuller's Earth*.

The *Age* of the *Inhabitants* is very Uncertain, becauſe none of them keep an Account of it; there are ſome of them very *Grey*: but if the Country be to them *Unhealthy*, *Grey-Hairs* may come Early. I think there be many more *Funerals* here than at *Oxford*, though that be a much Larger Place, eſpecially in the *Rain* times, which to us are always *Healthfull*.

I think that much of the *Mortality* (not all) that happens among *Strangers*, is the Effect of their Ill Diet and Ill Government of themſelves: for they Eat but little, having neither Stomach nor Money to Buy what they want; but they Drink Exceſſively, being for that more readily Truſted, and of Liquors very Hot and Spirituous; and if any chuſe the *Cold* rather, his Stomach is Chil'd and he is in danger of a *Flux*, or an *Extream Looſeneſs*, and that immediately.

There is another thing; Men Guard themſelves leſs from the *Air* than in any other Places, truſting to the *Heat* of the *Climate*, and receive the *Cool* of the Evening with only a Shirt. Now I think that the *Air*, though not ſo *Cold*, is much more *Subtile* and *Piercing* here, than in *England*: It Corrodes Iron much more; not by the *Moiſture*, for it is not ſo *Moiſt*, and beſides it does it in the *Dry Weather* too. The laſt Year, from *Nov.* 1686. to *Nov.* 1687. has had the moſt *Rain* of any that can be here remembred; yet the *Mortality* was much Leſs than the Years before; ſo that perhaps *Wet* is not that which makes the Country *Unhealthy*; though

vid. ſup. Vol. II. *Chap.* I.

we had very many *Sick*, especially in *June* and *July*, whose Diseases were not *Mortal*.

Observations in West Barbary, *from Cape* Spartel *to Cape* de Geer; *by Mr.* Jezreel Jones. *n.* 254. *p.* 248.

XXXV. The *Mauritanian* or *Barbarian Moor*, when he Rises in the Morning, Washes himself all over, and Dresses; then goes to their *Jiama*, or Church, says his *Prayers*, and returns Home, where his Wife, Concubine, or Slave, hath his Breakfast provided for him; which is sometimes made of *Barley* or *Wheat-Gruel*, for I have known both. It is made something Thicker than ours, till it be Ropy; they put *Origan*, and other Herbs, powder'd into it, which for such Uses they keep dryed all the Year; some will put a little *Pepper* and other *Spice*. I have often been Treated with *Warm Bread*, *Fresh Butter*, and *Honey*, in a Morning, which is not seldom used amongst themselves, an Hour or two after they have had *Gruel*; as also *Hasty-Pudding*, with *Butter*, and sometimes *Butter and Honey*. Some again give *Cuscusoo*, with Milk; others with *Flesh*, a third, with *Roots*. When any one hath a Guest or Guests in his House, the Neighbours bring their Dish to welcome him or them, on account of the Respect and Love they bear to their Neighbour, as well as to shew their Readiness to entertain the *Stranger*. This Practice is found constantly used throughout the whole Country amongst the *Moors*, one towards another, Reciprocally: And I have as often found the like Civility, as I had occasion to take up my Lodging at any Place, where I was acquainted with any of the Inhabitants. The *Jews* likewise shew great Civility to any *Christian*, and Treat him with what they have, as *Stew'd* or *Baked Hens*, *Capons*, *Hard Eggs* Boiled or Rosted, (which they Press flat with *Pepper* and *Salt*,) *Wine*, *Brandy*, *&c.* They have generally the Best *Bread*, and every thing else of the kind that they can get. They put *Annis*, and 2 or 3 other sorts of *Seeds* in their *Bread*; one is Black and Angled, Tasts almost like *Carrot-Seeds*, and I think I have seen these sometimes used in *Bread* in *Spain*. They esteem *Honey* as a wholsome *Breakfast*, and the most Delicious that which is in the *Comb*, with the *Young Bees* in it before they come out of their *Cases*, whilst they still look Milk-white, and resemble (being taken out) *Gentles*, such as *Fishers* use: These I have often Eat of, but they seemed Insipid to my Palate, and sometimes I have found they gave me the *Heart-Burn*.

In *Suse* I had a Bag of *Honey* brought by a Friend who made a Present of it, as being of great Esteem; This he told me, I was to Eat a little of, every Morning, to the Quantity of a Walnut; it was thick as *Venice Treacle*, and full of small *Seeds*. It always made me *Sleepy*, but I found my self Well, and in very good Temper of Body after it. The *Seeds* were about the bigness of *Mustard*: and according to the Description of them to me, and the Effects I found by Eating the *Honey* and them, they must be a large sort of *Poppy Seed*. The *Honey* was of that sort they call in *Suse*, *Izucanee* or *Origanum*, which (the *Bees* feed on, and) these *Seeds* were mixed with.

Cuscus or *Cusksoo*, is the Principal Dish among them, as the *Olla* is in *Spain* This is made of *Flower of Wheat*, and when that is scarce, of *Barley*, *Millet*, *Indian Corn*, *&c.* they shake some *Flower* into an Earthen Pan, made on purpose

purpoſe, which is not *Glazed*, ſprinkling a little Water on the bottom of the Pan firſt, then working it with both their open Hands Flat, turning them backwards and forwards to Grain it, till they make it much reſembling *Sago* which comes from the *Eaſt-Indies*. They *Stew* their *Fleſh*, keeping their Pots cloſe covered which are made of Earth, put the *Cuskſoo* into an Earthen *Cullender*, which they call *Caskaſs*, and this *Cullender* into the Mouth of the Pot, that ſo all the *Steam* which riſes from the Meat may be Imbibed by the *Cuskſoo* which cauſes it to ſwell, and makes it fit to be Eaten. When it is enough they put this *Cuskſoo* out into a Diſh, and the *Cuskſoo* being heaped up, they make (as it were) a Bed or Place for the Meat to lie in, then they put good ſtore of *Spice*, as *Ginger*, *Pepper*, *Saffron*, *&c.* This *Diſh* is ſet upon a Mat on the Ground, and 4 Men may eaſily ſit about it; tho' I have ſeen 6 and more at one Diſh: they ſit with their Buttocks upon the Calves of their Legs, with the bottom of their Feet on the Ground. If there are many to Eat of this Meal, there are more *Diſhes*. This *Diſh* they have in Uſe ſometimes at *Breakfaſt*, as well as *Dinner* and *Supper*, but it is commonly uſed for the two laſt Meals.

At a Stately Entertainment they will have a Sheep Roaſted whole, ſometimes a Half, or a Quarter on a *Wooden Spit*, or the moſt convenient thing they can find. They do not continually keep Turning it, as we do, but leiſurely let one ſide be almoſt Roaſted before they Turn the other. The Fire is commonly of *Wood* Burnt to Clear Coal, and made ſo that the Heat Aſcends to the Meat. They Baſte it with *Oyl*, and a little *Salt and Water* Incorporated They let it be throughly Roaſted; then They ſay, *Biſmiillah*, *In the Name of God*, after they have Waſhed their *Right Hands*, and Pulling the Meat in pieces, they fall to Eating. It is to be noted, that they never uſe but their Right Hand in Eating, and one holds while the other Pulls it aſunder, Diſtributing the Pieces to the reſt, as he Pulls it off. They ſeldom uſe a *Knife*, and a *Fork* is a ſtrange thing amongſt them. They are Dexterous at this way of *Carving*, and never flinch at the Heat or Warmth, for that would look mean, and might occaſion one more Bold to take his Office upon him to Perform. When they have done, they Lick their Fingers, and as often as they have a Hot Diſh, they Waſh their Hands afreſh. Then they have *Alfdouſh*, or *Virmizzelli*, with ſome Meat on it, Stewed Meat, well Spiced with Savory Broth; and after they have Eat the Meat, they dip their Bread in the Sauce, or Broth, and Eat it. They are cleanly in their Cookery; and if a Hair be found it is a Capital Crime, but a Fly not, becauſe it has Wings, and may get in after it paſſes from the Cook's Charge or Management.

Cubbob is ſmall pieces of Mutton with the Cawl of a Sheep wrapped on them. Some make good *Cubbob* of the Liver, Lights and Heart. They *Pepper* and *Salt* them, and put *Sweet Herbs* and *Saffron* into them, then Roaſt them, and when they Diſh them up, Squeeze an Orange or two on them.

Elmoroſia is another: This is Pieces of Beef, of *Cow* or *Camel*, Stewed with Butter, Honey, and Water; ſome will put *Rob* of *Wine* amongſt it;

they add Saffron, Garlick, or Onions, a little Salt, and when it is enough Serve it up. They eſteem this a Delicious Diſh, uſed moſtly in the Winter, and ſay, it is good againſt Colds, notwithſtanding they ſay Beef is Cooler than Mutton. Then they will treat you with Hare Stew'd, Stew'd and Roaſted Hens and Partridges: Theſe they Disjoynt, and let Stew in Water and Oyl, or Butter, if they are not Fat enough of themſelves. When they are almoſt enough, they Beat a Couple of Eggs, mix them with the Liquor, with Juice of Limon, or Vinegar, which they uſually have very good, and Serve it up.

Then you may have more Baked and Roaſt, and another Diſh of Stew'd Meat, which for its goodneſs would be eſteem'd amongſt us: They take a Leg of Mutton, cut off the Fleſhy part, leave out the Skin and the Sinews. This Fleſh they Mince very Fine, they alſo mince ſome Suet, Parſly, Thime, Mint, *&c.* Then they take Pepper, Salt, and Saffron beaten together, and ſome Nutmeg, and theſe they add to the reſt, with about half a Handful of Rice: they cut an Onion, of the beſt ſort, half through and take off the firſt Lay, as not ſo fit for Uſe, unleſs it be thick, (They that are curious take out the inner Skin, ſaying, it is not wholſome and bad for the Eyes, it being the worſt thing in an Onion, which otherwiſe would be the beſt of Roots:) This Lay they fill with forc'd Meat, then the next, and ſo on, which makes them look like ſo many Onions; ſome they put up in Vine-Leavs, of the beſt they can find for their purpoſe. Whilſt this is doing, the Bones and Reſidue of the Leg of Mutton, being in moderate pieces, are Stewing, with as much Water as will juſt cover them; then they put on their Forced Meat Balls a-top of the Meat, and a Green Bunch of Grapes upon them, Cover it, and let it Boil till throughly Enough. This, I think, is one of their Beſt Diſhes, which they often uſe in *Feſs* and other Cities.

Pillowe, or *Pilôe*, , is a Diſh very well known, made with Rice Boil'd, with a good Hen, Mutton, and Spice, the Fleſh and Fowl being put on the Rice in a Diſh, as *Cuskſoo*, and ſo ſerv'd up.

A *Buſtard*, which they Roaſt and Stew, and make an excellent Diſh of its *Guts*, (I Eat of it once) to me ſeem'd very Pleaſant and Savory, and very Grateful to the Stomach. This Bird is fit for their King's Table, as likewiſe the *Hedge-Hog*. Then they have *Ragous*, made with *Sparrows*, *Pidgeons*, &c.

Their *Drink* is Plain Water or Milk, and ſometimes *Rob* of *Wine* mix'd with Water. I was once Treated with this by the Baſhaw of *Suſe*, *Abdomeleck ben Alchotib*, and there was brought to me a great Bowl which held above 3 *Quarts*; he told me, there was not above half a Pint of this *Rob* in it and the reſt was fill'd with Water. It was very Generous and Pleaſant, and tho' I did not Drink a Quarter of it, yet I found the Strength in *half* an *Hour*. This they ſay is a Remedy againſt *Cold* likewiſe, and pretend to take it *Medicinally*; tho' *Rob* of *Grapes* is Lawful, according to *Their Law*. Under this Pretext, many *Feſſee* Merchants, to make *Rob* or *Vinegar*, Preſs all the *Grapes* in their Vineyards, put it up in great Jars Under-Ground, and keep

keep it long; ſo that it proves Excellent *Wine*. When 4 or 5 Merry Companions, with every one his Miſtreſs, appoint to be Merry, they go out to their Vineyard or Garden, have Muſick, and all or moſt of thoſe Diſhes, and there ſit and Carouſe over a great Earthen Bowl full of *Wine*, of about 4 or 5 *Gallons*, and ſo Drink round in a Cup that will hold almoſt a *Pint*, like a large *Tea-Diſh*, till there is none left; it often happens that they do not part till they have made an end of the whole Jar, which ſeldom is leſs than a *Week's* Time; I have known ſome that have been 9 *Days* ſucceſſively *Drunk*. Thoſe that are known to *Drink Wine*, or *Piſs Standing*, their *Teſtimony* will not be Valid in Law. In a Morning during this Time of Merriment, they are for ſome Savoury Bit, *Pickled Fiſh*, or *Eſcaveche*, or *Elcholle*. They are great Lovers of *Fiſh*, and have as great Variety, and very Good, which they Fry in *Origan Oyl*, Stew, Roaſt, and Bake, with good ſtore of Spice, Onions, Garlick, Cummin, Parſley, and Coriander. The *Eſcaveche*, or *Fry'd-Fiſh*, is cut in thin Slices, and put into Vinegar, with the aforeſaid Spices, adding Saffron and Pepper, *&c.* It will keep above a Month, and this they have commonly, as alſo *Pickled Limes*, *Olives*, *Capers*, *&c.* They Eat Parch'd *Garavanças*, Parched *Almonds*, and *Beans*, which they Parch in a Pan with Water and Salt. Theſe, and other things, they have to reliſh their Glaſs of *Wine*, or give them a Freſh Appetite to *Drink*.

The *Hedge-Hog* is a Princely Diſh amongſt them; and before they Kill him, Rub his Back againſt the Ground, by holding his Feet betwixt two, as Men do a Saw that Saws Stones, till it has done Squeaking; then they Cut its Throat, and with a Knife cut off all its Spines and Singe it. They take out its Guts, ſtuff the Body with ſome Rice, Sweet Herbs, *Garavanças*, Spice and Onions, they put ſome Butter and *Garavanças* into the Water they Stew it in, and let it Stew in a little Pot, cloſe ſtopped, till it be Enough, and it proves an excellent Diſh. The *Moors* do not care to Kill *Lamb*, *Veal*, nor *Kid*, ſaying it's a Pity to part the *Suckling* from its *Dam*.

They Eat with their Boil'd Meat, many times, Carots, Turnips of two or three ſorts, Cabbage, Beans and Peaſe, *&c.* of which they have Plenty, and very Good. I have Eat of *Porcupine* Stew'd, which much reſembled *Camel's Fleſh* in Taſte, and that is the neareſt to *Beef* of any thing I know.

I come now to give an Account of the *Alchollea*: It is made of Beef, Mutton, or *Camel's* Fleſh, but chiefly Beef, which they cut all in long Slices, Salt it well, and let it lie 24 Hours in the Pickle. Then they remove it out of thoſe Tubs, or Jars, into others with Water, and when it has lain a Night, they take it out, and put it on Ropes in the Sun and Air to Dry; when it is thoroughly Dry'd and Hard, they Cut it into pieces of 2 or 3 *Inches* long, and throw it into a Pan, or Cauldron, which is ready, with Boiling Oyl and Suet, ſufficient to hold it, where it Boils till it be very Clear and Red, if one Cuts it; which taken out, they ſet to Drein: When all is thus done, it ſtands till Cool, and Jars are prepar'd to Put it up in, pouring the Liquor they Fry'd it in upon it, as ſoon as it is thoroughly

roughly Cold they ſtop it up Cloſe. It will keep Two Years, it will be Hard, and the Hardeſt they look on to be Beſt done. This they Diſh up Cold; ſometimes Fryed with Eggs and Garlick; ſometimes Stew'd, and Limons ſqueez'd on it. It is very good any way, either Hot or Cold.

Before I conclude, I willingly give an Account of their *Travelling-Proviſion, viz.* Bread, Almonds, Raiſins, Figs, Hard Eggs, Cold Fowl, *&c.* But what is moſt uſed by Travellers, is *Zumeet*, *Tumeet*, or Flower of Parch'd Barley for *Limereece*. Theſe are not *Arabian* but *Shilha* Names, ſo I believe it is of a longer ſtanding than the *Mahometans* in that part of *Africk*. They are all Three made of Parch'd *Barley-Flower*, which they carry in a Leather Satchel. *Zumeet* is the Flower mix'd with *Honey*, *Butter* and *Spice*; *Tumeet* is the ſame Flower done up with *Origan Oyl*; and *Limereece* is only mixt with *Water*, and ſo Drunk. This Quenches Thirſt much better than *Water* alone, Satisfies a Hungry Appetite, Cools and Refreſhes Tir'd and Weary'd Spirits, overcoming thoſe Ill Effects a Hot Sun and Fatiguing Journey might Occaſion. This amongſt the Mountaineers of *Suſe*, is uſed for their Diet as well at Home as on their Journey.

All things taken in Game, as *Hawking*, *Hunting*, and *Fowling*, are *Lawfull* for them to *Eat*, if they take it before it be Dead, ſo that they can have time to Cut its Throat, and ſay, *Biſmiillahe*; or if he is known to be an Expert Man at the Game, and ſays theſe Words before he lets the *Hawk* take its *Flight*, let's *Slip* the *Grey-Hound*, or *Fires* his *Gun*, it is *Lawful*; all (I ſay but *Swine's Fleſh*, and what *Dies of it ſelf*) they have Liberty to *Eat*, and may Sell it. They tell us, there is but one part about the *Hog* or *Swine* that is *Unlawfull*, which they do not Know, and are oblig'd to *Abſtain* from the whole: but if they Knew it, they would let us have but little to our Share. They Eat *Snails* Boil'd with Salt, and Praiſe their Wholſomneſs. *Fiſh* of all ſorts are *Lawful*. In *Taffilet* and *Dra* moſt of their Food is *Dates*; there are Ten or a Dozen ſorts

They have good *Capons* all the Country over; no *Turkeys*, *Ducks*, nor *Geeſe*, but *Wild*, and thoſe they have of two ſorts; *Ducks*, *Teil* and *Mallard*, *Corlews*, *Plovers*, *Snipes*, *Oxbirds*, *Pipers*, a ſort of *Black Crow* with a *Bald Pate*, and long Crooked Bill, is good Meat; and a hundred other ſort of *Fowl*. I have Eat *Antelope*, which we have Kill'd in *Hunting*, and are very Good Food. They are as Large as a *Goat*, of a *Cheſnut* Colour and White under the Belly; Their Horns are almoſt quite Straight from their Head up, Tapering gradually, with Rings at a diſtance from one another, till within an *Inch* and a *half* of the Top; Fine Large Black Eyes, Long and Slender Neck, Feet, Legs and Body, ſhap'd ſomewhat like a *Deer*; they have two Cavities between their Legs, I think the Male as well as the Female. There are many in a *Herd*, when at the ſame time they have *Scouts*, or thoſe, who by Running give them notice of an approaching Foe. When two lie down together, they lay themſelves ſo, that their Backs are towards each other, and the Head of one towards the Tail of the other, that they may ſee every way. Their *Dung* is Sweet and Pleaſant enough. They are taken ſometimes by the *Hawk*, ſometimes by the *Shot*; for they are too *Swift* for a *Greyhound*.

Partridges

Partridges in *Sus* commonly Rooſt on *Trees*, there are ſo many *Foxes* which would otherwiſe deſtroy them.

The *Moors* will Eat *Fox*, if it be Fat, either Stewed or Roaſted, but they do not Care for it Lean, which has occaſioned a Proverb amongſt them on that Account, to wit, *Hellel deeb*, *Harom deeb*; alluding to the Scruple might be made of its *Lawfulneſs*. Thoſe Words ſignify, a *Fox is Lawful, and a Fox is Unlawful*; i. e. Fat, *Lawful*; Lean, *Unlawful*.

Fruits and *Sweet-Meats* they have of many kinds, as of 3 or 4 ſorts of *Pumpkins*, *Macaroons*, *Almonds* prepar'd many ways, *Raiſins*, *Dates*, *Figs* Dry and Green, excellent *Melons* of 2 or 3 ſorts, and *Water-Melons*, *Pomgranates* of ſeveral kinds, *Apples*, *Pears*, *Apricocks*, *Peaches*, *Mulberries* White and Black, *Plumbs* and *Damaſcus-Cherries*, *Grapes* of many kinds, and very Good, I have known *Grapes* in *Meſſia* (*Lat.* 30°. or thereabouts) as big as a *Pidgeon's Egg*, (but they do not Make *Wine*;) and if they would aſſiſt Nature, they might have every thing in Perfection.

Their *Salating* is *Lettuce*, *Endive*, *Carduus*, *Parſley*, *Apium*, and other *Sweet-Herbs*, *Onions*, *Cucumbers* of ſeveral kinds, ſome about a *Yard* in Length, and 2 or 3 *Inches* Thick, and Hairy, (this is eſteem'd the Wholſomeſt) *Radiſhes*, *Fumatas*, or *Apples of Love*, all which they Cut, and put Oyl, Vinegar, and Salt, with ſome Red-Pepper: This *Salate* they Eat with Bread.

They have a Fruit call'd *Baranêên*, in *Spain Baragenas*; theſe they Stew with their Victuals, and ſometimes Cut them in thin Slices, and Fry them; it makes a pretty Diſh.

When the *Moors* have Feaſted, every one Waſhes his Hands and Mouth, Thanks God, and Bleſſes the Hoſts and Entertainers from whom they had it; they Talk a Little and Tell ſome Story, and then lie down to Reſt.

XXXVI. Papers *of Leſs General Uſe*, Omitted.

1. GEneral Heads, for a *Natural Hiſtory of a Country*, Great or Small; by Mr. *Rob. Boyle*. n. 11. p. 186.

2. Directions for Obſervations and Experiments to be made by Maſters of Ships, Pilots, and other fit Perſons, in their *Sea Voyages*; by Mr. *Rook*: Enlarg'd by Sir *Rob. Murray*, and Dr. *Rob. Hook*. n. 8. p. 140. n. 24. p. 432.

3. Enquiries and Directions for the *Ant Iſles*, or *Caribbee* Iſlands; by .....: n. 33. p. 634.

4. Enquiries for *Virginia* and the *Bermudas*; by ..... n. 23. p. 420.

5. A Catalogue of ſeveral *Curioſities* found in *Virginia*; by Mr. *Jo. Baniſter*; and mention'd in ſome of his Letters to Dr. *Liſter*. n. 198. p. 667.

6. Inquiries for *Hungary* and *Tranſylvania*; by ..... n. 25. p. 467

7. Directions and Inquiries concerning the *Mines*, *Minerals*, *Baths*, &c. of *Hungary*, *Tranſylvania*, *Auſtria*, and other Countries neighbouring to thoſe; by ..... n. 58. p. 1189.

8. Inquiries for *Turkey*; by Mr. *H.* n. 20. p. 360.

9. Promiſcuous Inquries ſent to *Dantzick*; by ..... n. 19. p. 344.

10. Inquiries for *Greenland*; by ..... n. 29. p. 554.

11. Inqui-

n. 23. p. 420. 11. Inquiries for *Perſia*; by ....

n. 23. p. 415. 12. Inquiries for *Suratte*, and other Parts of the *Eaſt-Indies*; by ....

n. 180. p. 39. 13. A Voyage of the Emperor of *China* into the *Eaſtern Tartary*, *An.* 1682.

Ib. p. 52. A Voyage of the Emperor of *China* into the *Weſtern Tartary*, *An.* 1683.

Ib. p. 62. An Explication, neceſſary to juſtify the *Geography* ſuppos'd in theſe *Letters*; by ....

n. 25. p. 470. 14. Enquiries for *Ægypt*; by *Tho. Henſhaw*, Eſq;

n. 15. p. 472. 15. Enquiries for *Guiny*; by *Abraham Hill*, Eſq;

n. 23. p. 422. 16. Enquiries for *Guaiana* and *Braſil*; by ....

XXXVII. Accounts of *Books* Omitted.

n. 127. p. 671. 1. TH. *Bartholinus* de *Peregrinatione* Medica, *&c. Hafniæ.* 1674. in *Fol.*

n. 81. p. 4030. 2. *Caroli Claromontii*, M. D. *&c.* de Aere, Solo & Aquis *Angliæ*; deque Morbis *Anglorum* Vernaculis Diſſertatio: Nec non Obſervationes Medicæ *Cambro-Britannicæ. Lond.* 1672. in 12*o.*

n. 135. p. 875. 3. The Natural Hiſtory of *Oxfordſhire*, being an Eſſay toward the Natural Hiſtory of *England*; by *Rob. Plot*, L. L. D. *Oxford.* 1677. in *Fol.*

n. 184. p. 207 4. The Natural Hiſtory of *Staffordſhire*; by *Rob. Plot*, L. L. D.

n. 165. p. 795. 5. *Scotia* Illuſtrata; ſive Prodromus Hiſtoriæ Naturalis, *&c.* Auth. *Rob. Sibbaldo.* Equite Aurato. *Edinburgi.* 1684. in *Fol.*

n. 262. p. 543. 6. An Account of the Iſlands of *Orkney*; by *Ja. Wallace.* M. D. To which is added an Eſſay concerning the *Thule* of the Ancients. *Lond.* in 8*o.*

n. 141. p. 1030. 7. A Diſcourſe of the State of Health in the Iſland of *Jamaica*, with a Proviſion Calculated for the ſame, from the Air, the Place, and the Water; the Cuſtoms and manner of Living, *&c.* by *Tho. Trapham.* M. D.

n. 85. p. 5021. 8. *New England's* Rarities diſcover'd; together with the Remedies uſed by the Natives to Cure their Diſeaſes, Wounds and Sores, *&c.* by *J. Joſſelin*, Gent. *Lond.* 1672. in 12*o.*

n. 170. p. 980. 9. Deſcription de la *Loviſiane*, nouvellement Decouverte au *Sud. Oueſt* de la *Nouvelle France*; par *Louis Hennepin*, Miſſionnaire Recollect, *&c.* a *Paris* 1683. in 8*o.*

n. 91. p. 5170. 10. Obſervations Topographical, Moral, and Phyſiological, made in a Journey through part of the *Low-Countries*, *Germany*, *Italy* and *France*; by *J. Ray*, F. *R. S.* Whereunto is added a brief Account of *Fran. Willoughby*, Eſq; his Voyage through a great part of *Spain*, *Lond.* 1673. in 8*o.*

n. 66. p. 2017. 11. *Jo. Battiſta Donius* de Reſtituenda Salubritate *Agri Romani.*

n. 149. p. 268. 12. Hiſtoria Naturalis *Helvetiæ* Curioſa. Auth. *Joh. Jacobo Magnero*, M. D. *Tiguri.*

n. 54. p. 6049. 13. A Brief account of ſome Travels in *Hungaria*, *Servia*, *Bulgaria*, *Macedonia*, *Theſſaly*, *Auſtria*, *Styria*, *Carinthia*, *Carniola*, *Friuli*, &c. by *Edward Brown*, M. D. *Lond.* in 4*o.*

14. An

14. An Account of ſeveral Travels through a great part of *Germany*; by *Edw. Brown*, M. D. *Lond.* 1677. in 4*to*. n. 130. p. 767.

15. A Collection of Curious Travels and Voyages, in two Tomes: The Firſt containing Dr. *Leonhart Ranwolff*'s Itinerary into the *Eaſtern* Countries, *&c.* The Second taking in many parts of *Greece*, *Aſia Minor*, *Ægypt*, *Arabia*, *&c.* from the Obſervations of M. *Belon*, Mr. *Vernon*, Dr. *Spon*, Dr. *Smith*, Dr. *Huntingdon*, Mr. *Greaves*, and others. To which are added three Catalogues of *Plants* growing in the *Levant*. By *J. Ray*. n. 200. p. 768.

16. The Hiſtory of *Poland* in ſeveral Letters to Perſons of Quality: giving an Account of the Ancient and *Preſent State* of that Kingdom, Hiſtorical, Geographical, Phyſical, Political and Eccleſiaſtical, *&c.* with ſeveral Letters relating to Phyſick. Vol. I. To which is added a New Map of *Poland*. By *Bern. Connor*, M. D. *Lond.* 1697. in 8*vo*. n. 238. p. 98.

17. A Deſcription of the Iſlands and Inhabitants of *Feroë*, *&c.* written in *Daniſh*; by *Lucas Jacobſon Debes*, A. M. *Engliſht* by *J. S.* Dr. of Phyſick. in 12*o*. n. 119. p. 456.

18. Johannis Schefferi *Laponia*, *&c. Francofurti.* 1673. in 4*to*. n. 102. p. 31.

19. A Narrative of ſome Obſervations made upon ſeveral Voyages, undertaken to find a way for ſailing about the *North* to the *Eaſt-Indies*, and for returning the ſame way from thence Hither: Together with Inſtructions given by the *Eaſt India Company*, for the Diſcovery of the Famous Land of *Jeſſo*, near *Japan*. To which is added a Relation of Sailing through the *Northern America* to the *Eaſt Indies*; by *Dirick Rembrantz van Nierop*; at *Amſterdam*. 1674. in 4*to*. Abridg'd here. n. 109. p. 197.

20. Beſchriving der *Ooſt Indiſche* kuſten, *Malabar*, *Coromandel*, *Ceylon*, *&c.* Door *Philippus Baldæus*. T' *Amſterdam*. 1672. in *Fol.* n. 80. p. 3088.

21. Relations of divers Curious Voyages; by M. *Thevenot*. n. 14. p. 248. n. 89. p. 5128.

22. Relation du Voyage de L'Eveſque *de Beryte*, par le *Turquie*, la *Perſe*, les *Indes*, *&c.* juſques au Royaume de *Siam*, & autres Lieux; par M. *de Bourges*. n. 18. p. 327.

23. A Continuation of the Memoires of M. *Bernier*, concerning the Empire of the *Great Mogul*. *Engliſht* out of *French*. *Lond*. 1671. in 8*o*. n. 75. p. 2263.

24. The Six Voyages of *John Baptiſta Tavernier*, Baron of *Aubonne*, through *Turky* into *Perſia* and the *Eaſt-Indies*. In *Engliſh*. *Lond*. 1678. in *Folio*. n. 129. p. 711. n. 130. p. 751. n. 137. p. 942.

25. A New Account of *Eaſt India* and *Perſia*, in 8 Letters: being 9 *Years* Travels; begun 1672, and finiſhed 1681, *&c.* By *J. Fryar*. M. D. *Lond*. 1698. in *Fol.* n. 244. p. 338.

26. Voyage de *Siam* des Peres *Jeſuites*, Envoyez par le Roy aux *Indes* & a la *Chine*. a *Paris*. 1686. in 4*to*. n. 185. p. 249.

27. *Athanaſii Kircheri China* Illuſtrata. n. 26. p. 484.

27. Hebdomas Obſervationum de Rebus *Sinicis*; Auth. *Andræa Mullero* Greiffenhagio. *Coloniæ Brandenburgiæ*. *An.* 1674. n. 136. p 919.

28. Nouveaux Memoires ſur l'Etat Preſent de la *Chine*; par le L. P. *Louis le Conte*. S. J. *Amſterd*. 1697. in 12*o*. 2. *Vol.* Tranſlated into *Engliſh*. in 8*vo*. n. 229. p. 585.

n. 48. p. 973. 29. An Hiſtorical Eſſay endeavouring a Probability, That the *Language* of *China* is the *Primitive Language*; by *J. Webb* Eſq; *Lond.* 1669. in 8o.

n. 71. p. 2160. 30. Relatione dello *Stato Preſente* dell' *Egypto* ſcritta dal. Sig. *Gio. Mickaele Vanſlebio.* In *Parigi.* in 1670. in 12o.

n. 48. p. 972. 31. Hiſtoria General de *Ethiopia a Alta*; Perlo Padre *Balthaſar Tellez.* Em *Conimbra. An.* 1660. in *Fol.*

n. 14. p. 251. 32. The Cauſes of *Inundation* of the *Nile*; by M. *de la Chambre.*

n. 8. p. 145. 33. If. Voſſius de Nili & aliorum Fluviorum Origine.

n. 17. p. 304. n. 108. p. 182. 34. Die *Africaniſche* Landſchaft *Fetu* beſchrieben; durck *Wilhelm. Joban. Muller* von *Hamburgh*; Gedruckt zu *Hamburgh.* 1673. in 12o.

n. 211. p. 166. 35. An Account of ſeveral late Voyages and Diſcoveries to the South and North; towards the *Streights* of *Magellan*, the *South-Seas*, the vaſt Tracts of Land beyond *Hollandia Nova*, &c. alſo toward *Nova Zembla*, *Greenland* or *Spitsberg*, *Groynland* or *Engronland*, *&c.* By Sir *J. Narborough*, Capt. *Taſman*, Capt. *J. Wood*, and *Fred. Marten* of *Hamburgh.* To which are annexed a large Introduction and Supplement. The whole Illuſtrated with Charts and Figures. *Lond.* 1694. in 8*vo.*

n. 240. p. 196. 36. Voyages and Diſcoveries in *South America*: The firſt up the *River* of *Amazons* to *Quito* in *Peru*, and back again to *Brazil*; performed at the Command of the King of *Spain*, by *Chriſt. d'Acugna.* The Second up the *River of Plate*, and thence by Land to the Mines of *Potoſi*; by M. *Acarete.* The Third from *Cayenne* into *Guaiana*, in ſearch of the Lake of *Parima*, reputed the Richeſt place in the World; by M. *Grillet* and *Bechamel.* Done into *Engliſh* from the Originals; being the only Accounts of thoſe Parts hitherto extant, with Maps. *Lond.*

n. 225. p. 426. 37. An Account of a new Voyage Round the World; by *Will. Dampier* *Lond.* 1697. in 8*vo.*

CHAP. IV.

Miſcellaneous Papers.

A New Lamp; by *Mr.* Rob. Boyle. *Ph. Coll.* n. 2. p. 33. *Fig.* 76.

I. 1. A *B C D.* Is a *Veſſel of Latton*, well *Soder'd* every where.

BC. E F. Are Two *Bottoms*, *Soder'd* to that *Veſſel.*

F G. Is a *Pipe* Soder'd to the *Bottoms* aforeſaid; and whoſe *Aperture* is in the *Great Cavity*, *F A.*

H. Is a *Hole* in the *Pipe*, *F G.* Opening Between the Two *Bottoms*, *B C. E F.*

I. Is another *Hole*, to which is Soder'd a *Pipe*, I G. bended upwards at, *G.*

PP. Is a little *Veſſel* fit to receive the *Wick* of the *Lamp.*

LM. Is a Slender *Pipe*, Open at Both Ends, and Soder'd to the *Cover*, *AD.* in *L.* and to the *Bottom*, *EF.* in *M.* So that by that *Pipe* the Ex-

ternal

ternal Air may Communicate, Between the Two *Bottoms*, without Penetrating into the *Cavity*, *AF*.

N. Is a ſhort *Pipe*, Soder'd to a *Hole* in the *Cover*, *AD*. So that thereby one may pour *Oyl* into the *Cavity*, *AF*. and ſtop it afterwards very Cloſe with *Cork*.

For the *Filling* up of this *Engine*, you muſt Stop the *Aperture*, *G*. of the *Pipe*, *IG*. with a long Pin fitted for that purpoſe; and the Upper End of the *Pipe*, *LM*. muſt be Stopp'd too: then Pour in your *Oyl* by the *Aperture*, *N*. which done, this ſame *Aperture*, *N*. is to be *Shut* up Exactly, and both the other to be *Opened*, *viz*. *G*. and *L*. Then it will come to paſs, that the *Oyl*, through the *Pipe*, *IG*. will Run and Fill the *Veſſel*, *P*. till its Superficies be in the ſame *Level* with the *Hole*, *H*. and no more, as might be eaſily Demonſtrated.

Now it is eaſy to ſee that this *Lamp* is free from all *Inconveniencies* the *Lamp* of *Cardan* is Subject to; for

1. The *Air* doth not get into it by Starts or Gluts, as it doth in *Cardan's Lamp*: But when the *Oyl*, in *PP*. being *Waſted* by the *Flame*, comes to have its Superficies Lower than the *Hole*, *H*. the *Oyl* from the *Cavity*, *AF*. runs into *PP*. Gently, becauſe its Place left in the *Cavity*, *AF*. is eaſily Supplied by the *External Air*, which through the *Pipe*, *LM*. and the *Hole*, *H*. gets up into the ſaid *Cavity*, *AF*.

2. When the *Air* Contained in the *Cavity*, *AF*. comes to be *Rarify'd* by ſome *Heat*, it Drives out much *Oyl*, and ſo is Able to Choak *Cardan's Lamp*: But in this, the *Oyl* being ſo driven out gets into the Space between the Two *Bottoms*, as well as into the *Veſſel*, *PP*. Now the ſaid Space between the Two *Bottoms*, by reaſon of its Largeneſs, receiving *Twenty* or *Thirty* times more *Oyl* than the *Veſſel*, *PP*. it follows, that the Superficies of the *Oyl* therein Riſeth 20 or 30 times Leſs than if all the *Oyl* had been Driven into the ſaid *Veſſel*. Therefore when we *Fill* the *Lamp*, we muſt take Care that the *Pipe*, *L*. may be Well *Shut*, ſo that the *Air* between the two *Bottoms*, finding no Iſſue, may keep the *Oyl* from Filling that Space, which by that means, when the *Hole*, *L*. is Open, will be fit to Receive the *Oyl* Driven out by the *Rarefaction* of the *Air* in the *Cavity*, *AF*.

3. The *Oyl* being always kept almoſt at ths ſame Diſtance from the *Flame*, the *Wick* will not be Quickly *Conſumed*.

4. You have the conveniency to put *New Oyl* into the *Lamp*, without Moving or Extinguiſhing the ſame: for you need but Shut up, *G*. and *L*. and pour the *Oyl* through *N*. as hath been ſaid in the Beginning.

2. Let a *Lamp*, made 2 or 3 *Inches* Deep, with a *Pipe* coming from the Bottom, almoſt as High as the Top of the Veſſel, be Fill'd Firſt with *Water*, ſo High as to cover the *Hole* of the *Pipe* at the Bottom; to the end the *Oyl* may not get in at the *Pipe* (and ſo be Loſt:) then let the *Oyl* be poured in ſo as to Fill the *Veſſel* almoſt Brim full; which muſt have a *Cover* pierc'd with ſo many *Holes* as are Deſign'd to be *Wicks*. When the *Veſſel* is thus fill'd, and the *Wicks* are Lighted, if *Water* fall in by Drops at the *Pipe*, it will keep the *Oyl* always at the *Same Height*, or very near, the

Another; by Dr. Rob. St. Clare. n. 245. p. 380.

weight of *Water* to that of *Oyl* being, according to *Kircher's Table*, 20$\frac{8}{11}$ to 19. which in 2 or 3 *Inches* will make no Conſiderable Difference. If the *Water* runs Faſter than the *Oyle* Waſtes, it will only Run-over at the Top of the *Pipe*; what does not Run-over, will come under the *Oyl*, and keep it to the ſame Height.

Perpetual Lamps *in Imitation of the* Sepulchral Lamps *of the* Ancients; *by Dr.* Rob. Plot. n. 166. p. 806.

II. I have often heard it aſſerted that a *Metalline Wire*, eſpecially of the Beſt *Refined Gold* (whoſe Prerogative is, not to be *Diminiſh'd* by *Fire*) will lick up *Oyl*, and ſo make a *Perpetual Flame*, provided it be Supplied with a *Perpetual Oyl*: But I found (upon *Tryal*) in a *Faggot* of *Wire* made of Anneal'd *Iron*, of a Suitable bigneſs for a *Wick*, it would not Succeed by any manner of means I could readily think of; nor have I much Reaſon to think it will, either in *Wire* of *Silver* or *Gold*, the Nature of them All ſeeming not much Different, as to this Particular. If therefore it be neceſſary, that we muſt have a *Perpetual Wick* for the making ſuch *Perpetual Sepulchral Lamps*, as were uſed by the *Ancients*, I think we muſt make uſe of *Linum Aſbeſtinum*, *Earth Flax*, or *Salamanders Wool*, which will do the Office of a *Wick* tolerably well: and if it can any way be Supplied with a *Perpetual Oyl* (as I ſhall preſently ſhew you) I hope you will not judge me far from Effecting the matter. Now that there may be ſuch a *Bitumen* or *Inexhauſtible Oyl*, I will carry you no further than *Pitchford* in *Shropſhire*, to ſhew you: For there is a *Naphta*, or *Liquid Bitumen*, that conſtantly iſſues forth with a *Spring* there, and Floats upon the Water. This I would have *Separated* before it Joyns with the Water, into a *Ductus* of its own, and ſo Conveyed to the Place, thought moſt convenient for ſuch a *Lamp*, into which it ſhould as *Perpetually* Diſtil, as it does now into the *Fountain*; which, I doubt not, may be done without any great matter of Difficulty: And if ſo, we have an *Oyl* as *Everlaſting* as our *Wick*. Nor need we to fear any *Extinction* if incloſed in a *Tomb* or *Vault* under Ground, in never ſo Damp or Moiſt a place: It being the *Characteriſtick* of a *Bitumen*, to Burn beſt where there is Moiſture; as is Evident upon Affuſion of Water upon *Sea-Coal*. And this is One way I have thought of, that ſuch a *Perpetual Sepulchral Lamp* might Poſſibly be Contrived.

Vid. Vol. II. *Cap.* III. *Sect.* XCII & XCIII.

But if you will be ſo ſtrict with me, as not to allow this to be a *Perpetual Wick*, or that 'tis Probable one ſhould be made any Other way; as Unlikely may it ſeem, that there was ever any ſuch thing as a *Perpetual Lamp*, notwithſtanding the Teſtimonies of St. *Auſtin*, *Plutarch*, *Pliny*, *Ludovicus Vives*, *Baptiſta Porta*, *Licetus*, *Pancirollus*, and divers others: whereof ſome are ſaid to have Burnt 1000. ſome 1500. *Years*. But I dare not think ſo many, and ſo very good Authors, have all impoſed upon us; or that 'tis almoſt Poſſible that ſo many Notable Inſtances as are brought for them, ſhould all be Falſe. Much rather therefore ſhall I Determine (than wholly explode the thing) that the *Liquor* of theſe *Lamps* did *Burn* without any *Snuff* or *Wick* at all; as we ſee *Camphore* and moſt *Bitumens* will: It not being Expreſt (that I remember) in any of the Relations of

theſe

these *Lamps* that they were found with any *Wicks*; whence both the Inconveniences above mentioned attending a *Wick*, *ipso facto* Cease. It only therefore remaining, that we find out an *Inexhaustible Oyl*, which conveyed to a Fit Vessel might cause such a *Lamp*, why may not our *Bitumen* at *Pitchford* serve the Turn? Which no question will *Burn* without a *Wick*, as well as any other *Liquid Bitumen*. All the Objection I can foresee that is likely to obtain Advantage against such an Experiment, is that such a *Lamp* as this, would as likely *Burn* in the *Open Air*, as in an *Inclosed Damp Vault*, whereas the *Lamps* of the *Ancients* did Nourish their *Flame* best, where there was most *Want* of *Air*, only in *Close Vaults* and *Tombs*, and were presently *Extinguish'd* upon the least Immission of *External Air*; these being Qualities necessary, and almost always Asserted as Concomitants of the *Ancient Sepulchral Lamps*. To which I Answer first, that some of the *Lamps* of the *Ancients*, did as well Burn in the *Open Air*, as in *Close Damp Vaults*; as that mentioned by S^t. *Austin* in his Book *de Civitate Dei*, which Hung in the *Temple of Venus* always Exposed to the *Open Weather*, yet was never either *Consumed* or *Extinguish'd*. The *Lamp* also found in the *Tomb* of *Pallas* the *Arcadian*, Slain by *Turnus* in the *Trojan War*, was of this Kind, which remained *Burning* after it was taken forth, notwithstanding either *Wind* or *Water*, with which some did endeavour to Quench it. Now admitting our *Lamp* at *Pitchford* should thus *Burn* indifferently, under both Circumstances, what are we the worse? Since I never heard that the *Lamp* mentioned by St. *Austin*, or of *Pallas*, were ever the Less Esteemed or Admired, because they could not be Extinguish'd by the *Open Air*, as most of the rest have been said to be.

But if any Body be so nice that he must have an *Oyl*, in all Particulars answerable to that other sort of the *Ancients*, that *Burns* Best where there is *Want* of *Air*, and is Destroyed by its Admission: Let him but go with me into *Flintshire* to the *Coal-works* of Sir *Roger Mostyn* of *Mostyn* in that County, and he may have Satisfaction; where the *Miners*, when they have dug so Deep, that they begin to perceive a *Want* of *Air*, find a *Blewish Flame* to begin to Kindle of it self in the Fissures of the *Coal* (they sometimes Light their *Candles*) which *Blazes* and Moves up and down *Continually*, and sometimes *Shines* too upon the Surface of the Water in the Bottom of the Pits, shewing all the Colours of the *Rainbow*; which yet upon Drawing up of the Water that annoyes the works, and thereby stirring the *Air*, will Leave *Burning*: But as they Sink Lower, and are more remote from the *Day*, or *Super-terraneous Air*, still Encreases upon them. Whence it plainly appears, that this is a sort of *Fire* that so little requires *Air* for the maintenance of it, that it *Burns* Best when there is Least *Air*, and is *Extinguisht* when Disturb'd by the Motion of it; as the *Ancient Lamps* are said to be, upon the immission of *External Air*. The same sort of *Fire* has also been taken Notice of, in the *Coal-works* of *Somersetshire*, by the ingenious Mr. *Beaumont*; and by Mr. *George Sinclar* in the *Coal-works* of *Scotland*. This I doubt not but you will readily allow me to be as Probable a Material for the *Oyl* of this *Second* sort of *Perpetual Lamps*, as that of *Pitchford* was, for the

Vid. Vol. II. Chap. III. Sect. VII. 4.

the Former: But how, This or That, ſhall be ſo Managed, at to be put into a *Lamp*, and this *Lamp Perpetually* ſupplied, and Placed wherever it ſhall be Deſired; as it ſeems the *Lamps* of the *Ancients* might; this *Fire* being ſometimes found in Little *Pots*, *Glaſſes*, or *Urnes*, without any ſuch *Ductus* to them, as we required at *Pitchford*, or might do here; is a Difficulty perhaps not ſo eaſily Conquered. To which I muſt confeſs that I have only this to ſay, that unleſs there can be a Preparation Chymically made out of theſe *Bituminous* Materials, which thus naturally *Take Fire* of themſelves, or Preſerve it without a *Wick*, a ſmall Quantity whereof ſhall maintain ſo Tenuious a *Flame* as that there ſhall be no Conſiderable Conſumption of the matter in many *Years* (ſuch as the *Flame* over the *Well*, and *Earth* about it, in one Mr. *Hawkley*'s ground in *Lancaſhire*, that (like the *Fire* of *Plato*) only *Shines* and does not *Burn*) we muſt be contented to be Tyed to the Places where theſe Materials are.

Vid. Vol. II. *Chap.* III. *Sect.* VIII.

But if we can be content to quit theſe Materials, and to think that theſe *Lamps* (as many have done) did not *Shine* or *Burn* for all the Time they were Incloſed in thoſe *Tombs*, but were only *Inkindled* by the Admiſſion of *Air* when Opened, I have thought of a way not at all Lyable to any of the Defects or Inconveniences of the Two Former Ways; whereby a *Glaſs* of *Liquor*, incloſed in another (like the *Urns* of *Olybius*) upon immiſſion of *External Air*, ſhall certainly *Shine*, though it did not ſo before. And 'tis this: take a ſmall Phial, into which put a little of the *Liquid Phoſphorus* (which you all know, if the Phial be Stopt, *Shines* not at all;) Include this in the *Recipient* of an *Air-Pump*, out of which if the *Air* be well *Exhauſted*, the *Solid Phoſphorus* it ſelf will leave off *Shining* in 10 *hours* time, though in the *Summer-Quarter*, and the *Liquid* in Fewer; ſo that it ſhall ſhine no more, than when the Bottle containing it is ſtopt with a *Cork*. Now let ſuch an *Exhauſted Recipient*, with the included *Phoſphorus*, be placed in a *Tomb* or *Vault*, which are commonly Dark, and if ever found, and the Outer Glaſs broken, (as uſually ſuch things are, by Ignorant Men imployed in Digging) Poſſibly there will appear, upon immiſſion of the *Air*, as good a *Perpetual Lamp*, as ſome that have been found in the *Sepulchres* of the *Ancients*; though in all probability of a Different Kind, from all, or Moſt of them.

An Account of an Engine that Conſumes Smoak; *by* M. Juſtel. n. 181. p. 78.

III. M. *Daleſme* has found out a *Machine*, which though very Little and Portable, *Conſumes* all the *Smoak* of all ſorts of *Wood* whatſoever; and that ſo, that the moſt Curious *Eye* cannot Diſcover it in the Room, nor the niceſt *Noſe* Smell it, altho' the *Fire* be perfectly Open. This *Engine* is compoſed of ſeveral Hoops of Hammered *Iron*, of about 4 or 5 *Inches* Diameter, which ſhut one into the other: It ſtands upright in the Middle of the Room, upon a ſort of *Trevet* made on Purpoſe; *A* is the place where the *Fire* is made, where if you put little pieces of *Wood*, it will not make the leaſt *Smoak*, neither at *A*. nor *B*. Over which you cannot hold your Hand within *Half* a *Foot*, there comes out ſo great a *Heat*. If you take

Fig. 77.

take one of these pieces of *Wood* out of the *Fire* at *A.* it *Smoaks* presently, but Ceases immediately so soon as it is Cast into the *Fire* again. The most *Fetid* things, as a *Coal* steept in *Cats-piss*, which *Stinks* Abominably when taken out of the *Fire*, notwithstanding in this *Engine* makes not the least *Ill Scent*; The same did *Red-Herrings* Broiled thereon. On the other side all *Perfumes* are Lost in it, and *Encense* makes no *Smell* at all, when *Burnt* therein. We Learnt, that this is not Shown, but when the *Fire* at *A.* is well Kindled, and the *Tunnel B D.* very *Hot*, so that the *Air* that Feeds the *Fire*, cannot come that way, but must all Press in upon the Open *Fire*, whereby the *Smoak* and *Flame* is all Forced Inwards, and must pass through the Heap of *Burning Coals* in the *Furnace*, *A.* in which Passage the parts thereof are so Dispersed and Refined, that they become *Inoffensive* both to the *Eye* and *Nose*.

IV. The Best Remedies against *Cold* are such as Retain *Heat*, or Continue *Fire* Longest. To this purpose some have taken Notice, That *Joyners* use *Leaden-Pots* for their *Glue*, Alledging for a Reason, that *Lead* being a Close Mettal, Retains the *Heat* Longer than other Mettals. *Cary's Warming Stone* Promised a Warmth for 6 or 8 *Hours*; if it Performed but for 2 or 3 *Hours*, it would be of Great Use. 'Tis found by sad Experience, how Hurtful *Bright Fires*, and especially of *Stone-Coal*, are to the *Eyes*.

Some Suggestions for Remedies *against* Cold; *by* . . . n. 21. p. 379.

To Retain *Fire* Long, certain *Black Earths* are useful; as we were lately Informed by the Inquisitive Dr. *B.* That a Gentleman in *Somersetshire* call'd Mr. *Speke*, had bountifully Obliged *Ilminster*, and his Neighbourhood, by a *Black Fat Earth* lately found in his *Park*. But the same Correspondent adds, that he never saw any Parallel to a *Sea-weed*, which he and his Fellow Students had in *Cambridge*, in the Mouth of a *Barrel* of good *Oysters*, it was smaller than *Pease halm*, yet cut, it Lasted 2 very Great *Fires* of *Sea-Coal*, burning bright in the Midst of the *Fire*; and by a Stroak of the Tongs, it fell into the *Hearth*, *Jingling* like *Mettal*.

V. *May.* 5. 1665. Fresh *Mackrels* were Boyl'd in Water, with *Salt* and *Sweet Herbs*; and, when the Water was perfectly Cold, the next Morning, the *Mackrels* were left in the Water for *Pickle*.

Observations on Shining Fish; *by* *Dr.* Beal. n. 13. p. 226.

May 6. More Fresh *Mackrels* were Boyl'd in like Water; and *May* 7. both Water and *Mackrels* were put into the Former Water, together with the former *Mackrels*. (Which Circumstances I do particularize, because whether the Mixture of the *Pickle* of several Ages and a Certain Space of Time, or what ever else was Necessary, and Wanting, the Tryal did not Succeed with the like Effect at other Times.)

But now on *May* 8 Evening, the Cook Stirring the Water, to take out some of the *Mackrels*, found the Water at the First Motion become very *Luminous*, and the *Fish Shining* through the Water, as adding much to the *Light* which the Water yielded. The Water, by the Mixture of *Salt* and

Herbs

Herbs in the Boyling, was of it ſelf Thick and rather *Blackiſh*, than of any other Colour; yet being Stirr'd it *Shined*, and all the *Fiſh* appear'd more Brightly *Luminous* in their own Shapes.

Wherever the Drops of this Water (after it was ſtirr'd) fell on the Ground, or Benches, they *Shined*: And the Children took Drops in their Hands, as broad as a *Penny*, and running with them about the Houſe, and each Drop both neer and at Diſtance, ſeem'd, by their *Shining*, as broad as a *Six-pence*, or a *Shilling*, or broader.

The Cook turned up the ſide of the *Fiſh* which was Loweſt, and thence came no *Shining*: and after the Water was for ſome good time Setled, and fully at Reſt, it did not *Shine* at all.

On Tueſday night *May* 9. we repeated the ſame Tryal, and found the ſame Effects. The Water, till it was Stirr'd gave no *Light*, but was Thick and Dark, as we ſaw by *Day Light*, and by *Candle-Light*: As ſoon as the Cooks Hand was thruſt into the Water, it began to have a *Glimmering*; but being gently ſtirred by the Hand moving Round it did ſo *Shine*, that they who Looked on it at ſome Diſtance, from the further End of another Room, thought verily it was the *Shining* of the *Moon* through a Window upon a Veſſel of *Milk*; and by brisker Circulation it ſeem'd to *Flame*.

The *Fiſh* did then *Shine* as well from the Inſide as the Outſide, and chiefly from the *Throat*, and ſuch places as ſeemed a little Broken in the Boyling. I took a piece, that *Shined* Moſt, and Fitted it as well as I could deviſe in the Night, both to my great *Microſcope*, and afterwards to my little one: But I could diſcern no *Light* by any of theſe *Glaſſes*, nor from any Drops of the *Shining* Water, when put into the *Glaſſes*. And *May* 10. in the Brighteſt Rays of the *Sun*, I Examined in my Great *Microſcope*, a ſmall broken piece of the *Fiſh*, which *Shined* moſt the Night before; We could find nothing on the Surface of the *Fiſh* very Remarkable. It ſeem'd *Whitiſh*, and in a manner Dried, with Deep Inequalities; And others, as well as my ſelf, thought, we Saw a Stream, rather *Darkiſh*, than *Luminous*, ariſing, like a very ſmall Duſt, from the *Fiſh*: And rarely, here and there, a very Small and almoſt Imperceptible *Sparkle* in the *Fiſh*. Yet of theſe *Sparkles* we are certain; we numbred them, and agreed in the Number, Order, and Place. Of the *Steam* I am not Confident, but do Suſpect our *Eyes* in the *Bright Sun*; or that it might be ſome *Duſt* in the *Air*.

The Great *Microſcope* being fitted in the Day-Light for this piece of *Fiſh*, we Examined it that Night, and it Yielded no *Light* at all, either by the View of the *Glaſs*, or otherwiſe.

Finding it *Dry*, I thought that the Moiſture of *Spittle*, and Touching of it, might Cauſe it to *Shine*: And ſo it did, though but a very Little, in a few ſmall Sparks, which ſoon *Extinguiſh't*. This we ſaw with the *Bare-Eye*, not in the *Glaſs*.

The *Fiſh* were not yet *Fetid*, nor inſipid to the beſt diſcerning Palats: And I cauſed two *Fiſh* to be kept for further Tryal, 2 or 3 *Days* longer,

till

till they were *Fetid* in very Hot Weather; and then I expected more *Brightneſs*, but could find None, either in the *Water* by Stirring it, or in the *Fiſh*, taken out of the Water.

Obſervations about Shining Fleſh; *by Mr.* Rob. Boyle. n. 89. p. 5108.

VI. 1. *Mar.* 15. 167½. When I was about to go to Bed, an *Amanuenſis* of mine informed me, that one of the Servants of the Houſe, going upon ſome Occaſion into the *Larder*, was frighted by ſomething of *Luminous* that ſhe ſaw (notwithſtanding the Darkneſs of the place,) where the *Meat* had been Hung up before; Whereupon I preſently ſent for the *Meat* into my Chamber, and cauſed it to be placed in a Corner of the Room being made conſiderably Dark, and then I plainly ſaw, both with Wonder and Delight, that the Joynt of meat did in divers places *Shine* like *Rotten Wood* or *Stinking Fiſh*. The chief Circumſtances and *Phænomena*, that I had Opportunity to take notice of, at ſo Inconvenient an hour, were Theſe.

1. That the Subject, we diſcourſe of, was a *Neck* of *Veal*, which had been bought of a Country-Butcher on the *Tueſday* preceeding.

2. In this one Piece of *Meat* I reckoned diſtinctly above 20 ſeveral places that did all of them *Shine*, though not all of them alike, ſome of them doing it but very Faintly.

3. The bigneſs of theſe *Lucid* parts was differing enough, ſome of them being as big as the *Nail* of a Man's middle *Finger*, ſome few bigger, but moſt of them Leſs. Nor were their Figures at all more Uniform, ſome being inclined to a *Round*, others almoſt *Oval*, but the greateſt part of them very Irregularly ſhap'd.

4. The Parts that *Shone* Moſt, were ſome *Griſtly* or Soft parts of the *Bones*, where the *Butcher's Cleaver* had paſſed: But theſe were not the Only parts that were *Luminous*; for by drawing too and fro the *Medulla Spinalis*, we found that a part of that alſo did not *Shine* ill: And I perceived one place in a *Tendon* to afford ſome *Light*; and laſtly 3 or 4 Spots in the *Fleſhy* parts at a good diſtance from the *Bones*, were plainly diſcovered by their own *Light*, though that were Fainter than in the parts above-mentioned.

5. When all theſe *Lucid* parts were ſurveyed together, they made a very Splendid ſhew: So that applying a Printed Paper to ſome of the more *Reſplendent Spots*, I could plainly *Read* divers Conſecutive *Letters* of the *Title*.

6. The Colour that accompanied the *Light* was not in all the ſame: But in thoſe which ſhone Livelieſt, it ſeemed to have ſuch a fine *Greeniſh Blew*, as I have divers times obſerved in the *Tails* of *Gloworms*.

7. But notwithſtanding the Vividneſs of this *Light*, I could not by the Touch diſcern the leaſt Degree of *Heat* in the parts whence it proceeded; and having put ſome marks on one or two of the more *Shining* places, that I might know them again when brought to the Light, I apply'd a *Seal'd Weather Glaſs*, furniſhed with *Tinctted Spirit* of *Wine*, for a pretty while, and could not ſatisfie my ſelf, that the *Shining* parts did at all ſenſibly Warm the *Liquor*.

8. Notwithſtanding the great Number of *Lucid* parts in this *Neck* of *Veal*, yet neither I, nor any of thoſe that were about me, could perceive by the *Smell* the leaſt degree of *Stink*, whence to infer any *Putrefaction*; the *Meat* being judged very Freſh, and well conditioned and fit to be Dreſſed.

9. The Floor of the *Larder*, where this *Meat* was kept, is almoſt a Story Lower than the Level of the Street, and 'tis Divided from the Kitchin but by a partition of boards, and is furniſhed but with One Window, which is not great, and looks toward the Street, which lies *Northward* from it.

10. The *Wind*, as far as we could obſerve it, was then at *South West*, and Bluſtering enough. The *Air* by the *ſeal'd Thermoſcope* appeared Hot for the Seaſon. The *Moon* was paſt its *Laſt Quarter*. The *Mercury* in the *Barometer* ſtood at $29\frac{3}{16}$ *Inches*.

11. We cut off with a Knife One of the *Luminous* parts, which proved to be a Tender *Bone*, and being of about the Thickneſs of a *Half Crown* piece, appeared to *Shine* on both ſides though not Equally; and that part of the *Bone* whence this had been cut off, cotinued Joyned to the reſt of the *Neck* of *Veal*, and was ſeen to *Shine*, but nothing near ſo Vividly as the Part we had taken off did before.

12. To try, whether I could obtain any *Juice* or moiſt Subſtance from this, as I have ſeveral times done from the *Tails* of *Gloworms*, I rub'd ſome of the Softer and more Lucid parts, as dextrouſly as I could, upon my Hand, but I did not at all perceive any *Luminous Moiſture* was thereby imparted; though the *Fleſh* ſeem'd by that Operation to have loſt ſome of its *Light*.

13. I cauſed alſo a piece of *Shining Fleſh* to be Compreſſed betwixt two pieces of *Glaſs*; but I did not find the *Light* to be thereby *Extinguiſhed*.

14. I put a *Luminous* piece of *Veal* into a *Chryſtalline* Phial; and pouring on it a little Pure *Spirit* of *Wine*, after I had ſhaken them together, I laid by the Glaſs, and in about a *Quarter* of an *Hour* or leſs I found that the *Light* was *Vaniſhed*.

15. But *Water* would not ſo eaſily Quench our ſeeming *Fires*; for having put one of them into a *China* Cup, and almoſt fill'd it with *Cold Water*, the *Light* did not only appear, perhaps Undiminiſhed, through that Liquor, but above an *Hour* after was Vigorous enough not to be *Eclipſed* by being looked upon at no great Diſtance from a Burning Candle.

16. While theſe things were doing, I cauſed the *Pneumatical Engine* to be prepared in a Room without Fire, (that the Experiment might be tryed in a greater degree of *Darkneſs*;) and having Conveyed one of the Largeſt *Luminous* pieces into a ſmall *Receiver*, we cauſed the *Pump* to be plied in the Dark; and perceived upon the Gradual withdrawing of the *Air*, a Gradual *Leſſening* of the *Light*; which yet was never brought quite to *Diſappear* (as I long ſince told you the *Light* of *Rotten Wood* and *Gloworms* had done,) or to be ſo near *Vaniſhing* as one would have Expected. But by

the

Hasty Increase of *Light*, that disclosed it self in the *Veal* upon this Letting in of the *Air* to the *Exhausted Receiver*, it appeared more manifestly than before, that the Decrement, though but Slowly made, had been Considerable. This Tryal we once more Repeated with a not unlike Success; which though it Convinced us, that the *Luminous* matter of our included Body was more Vigorous or Tenacious than that of most other *Shining* Bodies; yet it left us some Doubts, that the *Light* would have been much more Impaired, if not quite made to *Vanish*, if the Subject of it could have been kept long enough in our *Exhausted Receiver*.

17. It was also found that a *Legg* of the same *Veal*, had some *Shining* places in it; though they were but very few and faint in Comparison of those, that were Conspicuous in the above mentioned *Neck*.

18. *March* 16. Between 4 and 5 in the Morning I lookt upon a Clean *Phial*, that I had laid upon the Bed by me after a piece of our *Luminous Veal* had been included in it, and found it to *Shine* Vividly. I lookt upon it again the 3*d*. *Day* (inclusively) after we had first observed the *Meat*, 'twas cut off from, to be *Luminous*, and I found it to *Shine* in the Dark as Vigorously as ever. The 4*th Day* its *Light* was also Conspicuous; so that I was able in a Dark Corner of the Room to shew it even in the *Day Time* to 3 or 4 very Ingenious Physitians. But before the Night following the *Light* begun to Decay, and the Offensive *Smell* to grow somewhat Strong; which seems to Argue, that the Disposition, upon whose account our *Veal* was *Luminous*, may very well consist both with its being and not being in a State of *Putrefaction*, and consequently is not likely to be Derived meerly from the One or the other. The 5*th Day*, in the Morning looking upon it before the Curtains were opened, it seem'd to *Shine* better than it had done the day preceeding. The same Night also it was manifest enough, though not Vivid, in the Dark. When I awaked the 6*th* Day in the morning after the *Sun* was *Risen*, I could within the Curtains perceive a Glimmering *Light*: But the 7*th*. *Day*, I could not late at Night discern any *Light* at all.

19. I shall only add and Conclude with one Observation more, which may possibly take off our thoughts from Striving to Deduce the *Shining* of our *Veal* from the Peculiar *Nourishment*, or *Constitution*, or *Properties* of that *Individual Calf*, whose *Flesh*, *&c.* was *Luminous*: For, having several Nights sent purposely into the Larder, to observe, whether any *Veal*, since brought thither, or any Other *Meat*, did afford any *Light*, a Negative answer was always brought me back; save at one time, which happened to be within less than 48 *Hours* of that, at which the *Luminousness* of the *Veal* had been first taken notice of; for at this time there was in the same *Larder* a Conspicuous *Light* seen in a *Pullet*, that Hung up there, which having Caused to be brought up in a Darkened place in my Chamber in the Night time, I perceived 4 or 5 *Luminous* places, which were not indeed near so Large as those of the *Veal*, but were little less *Vivid* than they. All of these I took notice to be either upon or near the *Rump*; and that which appeared

most like a Spark of *Fire*, *Shone* at the very Top of that Part. Yet was not this Fowl *Mortified*, nor at all *Ill scented*, but so Fresh, that the next day I found it very Good Meat.

By Dr. J. Beal. n. 125. p. 599.

2. 1. Upon *Friday* (*Feb.* 25. $167\frac{5}{6}$.) a Woman of *Yeovil* in *Somersetshire* bought in the Market a *Neck* of *Veal*, which seem'd well Coloured, and well Conditioned in every respect: The *Calf*, a *Cow-calf*, was kill'd in the Evening the Day before; it was Hung to a Shelf in a little Chamber, where she and her Husband lay; upon the following *Saturday*, about 9 in the Night, the *Neck* of *Veal shined* so Bright, that it did put the Woman into a great affrightment. She calls up her Husband; he hastens to the *Light*, as fearing *Fire* and Flames, and seeing the *Light* come only from the *Flesh*, he caught the *Flesh* in his Left Hand, and beat it with his Right Hand, as endeavouring to Extinguish the *Flame*; but without effect. The *Flesh shined* as much, if not more, than before, and his Hand, with which he beat the *Flesh*, became all in a *Flame*, as bright and Vivid, as the *Flesh* of the *Veal* was, and so it continued, whilst he went from place to place, shewing it to others. Then he thrusts his *Blazing* Hand into a Pail of pure *Water*; this could not Extinguish the *Flame* at all, but his Hand *shined* through the *Water*. At last he took a Napkin, and Wiped his Hand, till he wiped off all the *Light*. The next Day (being *Feb.* 27.) the *Veal* was Dressed, and some of the Neighbours, who saw it *shining*, were invited to Eat of it; all esteem'd it as Good, as any they had Eaten. A part of it was kept for *Feb* 28, and 29. in which time it lost nothing of its *Sweetness*.

2. And now I want not a Parallel in Consort for that part of this Relation, which seemeth strangest: For on *Tuesday* (being *April* 4. 1676) a Fat *Pork* was kill'd for my Family; within Two Days, the *Guts*, or (as some call them) the *Chitterlings*, and *Feet* of the *Pork* were Boyl'd, and after they were throughly Cold, they were put, in due order, in *Souse drink*, or *Pickle*, in a Low Room on the North side, which had little Light at Mid-day, and was very Dark, as soon as Night began, *Apr.* 8. all those Parts of the *Gutts*, and the *Claws* of the *Feet*, which Floted on the top of the *Pickle*, began to *Shine*, and the Parts Immersed under Water gave no *Light*; The Light Encreased Daily more and more in all the Parts that Floated. *Apr.* 13. the *Light* seemed as Bright as the Brightest *Moon-shine*. Thus it continued to *Shine* (but Fainter and Fainter, and in Fewer Parts) almost a *Week* longer; for, being often tumbled up and down, by slow Degrees all sunk into the *Pickle*, and then all the *Light* Expired. Whilst the *Light* was Vivid, I caused a Maid-servant to Rub one of her Hands upon the *Shining* Part; after which, she came through 3 Rooms, into the place where I sate, between a great Fire on one side, and a Candle or two on a Table near at Hand, on the other side; and in this place she shewed me her Hand, all over *Shining*, as Bright as *Moon-shine*; one indeed stood between her Hand and the Fire, another between her and the Candles. Thence I went into another Room, where there was but a small Fire, and no Candle, but (at that time) a little *Moon shine* through a Window: there the *Shining* Parts of her Hand, or indeed her Hand all over, appeared

to

to be very Bright *Flames*. Then I cauſed ſome of the *Shining Pork* to be brought into the ſame Room, and Examined, whether the *Pickle* did not *Shine*, and ſo might give the *Flaming* Tincture to the Maids Hand: but by Wiping the *Pork* diligently with a Napkin, till it was perfectly Dryed, we found that the *Flame* of the *Pork* was rather Encreaſed, (as we all thought) than Diminiſhed. Then I deſired all the Company, (whereof ſome were young Children, which have the Tendereſt *Touch*) to try, whether the moſt *Flaming* Parts had any perceptible degree of *Tepidity*: all agreed, that they could Feel no Warmth, and that all the Parts of the *Pork* were manifeſtly *Gelid*; but ſome thought that they perceived the *Luminous* Parts Leſs *Gelid* than the *Dark* parts, others Denied it: For my own part, I found not ſo much difference, as could clear me from ſuſpecting a Prepondering Fancy. After theſe Trials, the Maid Wiped off the *Light* from her Hand, by Rubbing her Hand ſtrongly with a Napkin, 3 or 4 times over.

3. I took Notice, that by this Acquired *Blaze*, the Face and Hands would appear a great deal Larger than they were; and the manner how it was done being Concealed, the Learned and Ingenious might be at a loſs to diſcover what it might be: ſo that it might fitly ſerve for an *Impoſture*.

4. Hiſtories report of a Suddain and Short *Fulgor* about the Countenance of the *Living*, which they Interpreted to Preſage ſomething Extraordinary, by which thoſe Perſons became Illuſtrious; but of *Dead Carkaſſes*, which became thus *Luminous*, I have Read nothing in Old *Records*. That *Mackrels* in their *Pickle*, did caſt a *Shining Blaze*, ſome days before they were *Ill-Taſted*, or Ill-Scented, I gave you notice *May* 5. 1665. ſince which Time I Tried often to obtain the Like, but without Succeſs; though I know not what Circumſtance was wanting. *Vid. Sup.* Sect. V.

5. The *Pickle* in which the *Pork* was put, was made only of *Pure Water*, *Bran*, and *Bay-Salt*, and was ſo far from *Shining*, that it Quencht the *Light* by Degrees of the *Shining Fleſh*. The *Mackrel-Pickle* (which was Boil'd with a Mixture of *Sweet Herbs*) by a little Stirring became ſo *Luminous*, that a Drop of it in the Palms of Childrens Hands appeared as Broad as a *Shilling*, or Broader; ſo that a Waſh of it might alſo fitly ſerve for an *Impoſture*.

6. I think *Shining Worms* are ſeldom Found in *Oyſters*, as was formerly obſerved by M. *Auzout*. And perhaps one may wait a long day, before he ſhall See ſuch a long laſting *Light* in the *Iceland-Seas* as was remarked by *Biornonius*. So that I cannot Wonder, if Expert *Chymiſts* do by ſome *Chance* obtain more, than by *Art* and much *Diligence* they can Repeat again, ſince they Deal with ſuch Fickle Agents, as *Fire* and *Flame*. I have heard of ſome *Dews* on Meadows, *Shining* in the Early Morning, before Day Light; but thoſe more frequently. Theſe and much better, ſome of Mr. *Boyle's* Inſtances in His *Pneumatical Experiments*, and more in his Diſcourſe of *Luminous Gems* at the end of his elaborate Treatiſe of *Colours* may, at leaſt, by Reſemblances, inſtruct us to apprehend the Nature of ſome *Shining Meteors* among the *Clouds*, or in our *Lower Region*, of which, they ſay, ſome have a *Singeing Heat*, and do *Blaſt*; and that ſome are to the Tou *Gelid*, yet do *Poyſon* or *Corrupt* our *Fleſh*. *Vid. Vol.* II. *Chap.* VI. Sect. LXIII. *Vid. Sup. Chap.* III. Sect. XXVI. *Exp.* 37.

7.

7. I ſhall only add, That I gave full Warning to obſerve whether the *Light* in my two Inſtances had any *Blewiſh* or *Greeniſh Tincture*; all that ſaw both, affirmed the *Light* to be as Clear as the Brighteſt *Moon-ſhine*, and ſo it appeared to my own Eyes; and I can perfectly Remember, that I really thought the Beams which came from the *Mackrel*, and the Stirred Pickle, to be Bright *Moonſhine*, till a Servant brought me to the *Veſſel*, to ſee the contrary.

Poſtſcript. We had a Report (whether True or falſe, you may beſt know) of *Shining Beef* in the *Strand*, about the ſame time, when the *Neck* of *Veal*, firſt mention'd, Shined Here. And it was here Obſerved, that the *Stars* had a Glaring Brightneſs and Largeneſs, more than Ordinary, and for ſome *Months* before, and ever ſince, the *Weather* hath been more Gentle, Warm, and Dry, than is Uſual in theſe *Months*; but 'tis above my skill to demonſtrate, how this belongs to the matter in hand. *Note*, that the *Mackrel-Pickle* was Thick and not Tranſparent, till it was Stirred and *Flaming*; the *Pork Pickle* was Clear, or Tranſparent, yet *Shined* not in any part.

Obſervations about the Reſemblances and Diſferences between a Burning Coal *and* Shining Wood; *by Mr.* Rob. Boyle. n. 32. p. 605.

VII. The things, wherein I obſerved a piece of *Shining Wood* and a *Burning Coal* to Agree or *Reſemble* each other are principally theſe *Five*.

Reſemblances.

1. Both of them are *Luminaries*, that is, give *Light* as having it (if I may ſo ſpeak) *Reſiding in them*, and not like *Looking-Glaſſes* or *White Bodies*, which are Conſpicuous only by the *Incident Beams* of the *Sun*, or ſome other *Luminous* Body, which they *Reflect*.

This is evident, becauſe both *Shining Wood* and a *Burning Coal* Shine the more Vividly, by how much the Place wherein they are put is made the *Darker*, by the careful Excluſion of the *Adventitious Light*.

2. Both *Shining Wood* and a *Burning Coal* need the Preſence of the *Air*, (and that too of ſuch a *Denſity*,) to make them Continue *Shining*.

This has been proved as to a *Coal*, by what I long ſince publiſhed in my *Phyſico Mechanical Experiments*: And as to the *Shining Wood*, the Experiments I have lately ſent you, make it needleſs for me to add any other proof of the Requiſiteneſs, not only of *Air*, but of *Air of ſuch a Thickneſs*, to make its *Light* Continue.

Vid. Vol. II. Sect. LXXVI.

3. Both *Shining Wood* and a *Burning Coal*, having been Deprived for a time of their *Light*, by the withdrawing of the Contiguous *Air*, may preſently recover it by Letting in Freſh *Air* upon them.

The *Former* part of this, particular Tryals have often ſhewn you to be True, when *Kindled Coals*, that ſeem to be *Extinguiſht* in our *Exhauſted Receivers*, were preſently *Revived*, when the *Air* was Reſtored to them: And the Latter part is abundantly Manifeſt by the *Experiments* above mentioned.

4. Both a *Quick Coal* and *Shining Wood* will be eaſily Quenched by *Water* and *many other Liquors*.

The Truth of this, as to *Coals*, is too Obvious to need a Proof, and therefore I ſhall confirm it only as to *Wood*; For which purpoſe you may be pleaſed to take the following Tranſcript of ſome of my *Notes* about *Light*.

I took

I took a piece of *Shining Wood*, and having wetted it with a little Common *Water* in a clear Glaſs, it preſently loſt all its *Light*.

The like Experiment I tried with Strong *Spirit* of *Salt*, and alſo with a Weak *Spirit* of *Sal Armoniack*; but in both, the *Light* did upon the *Wood's* Imbibing of the *Liquor* preſently *Diſappear*.

I made the like Tryal with *Rectified Oyl* of *Turpentine*, with a not unlike Succeſs. The ſame Experiment I tried more than once with High *Rectified Spirit* of *Wine*, which did immediately Deſtroy all the *Light* of the *Wood* that was Immerſed in it; and having put a little of that *Liquor* with my Finger upon a part of the whole piece of *Wood* that *Shone* very Vigorouſly, it quickly did, as it were *Quench* the *Coal* as far as the Liquor Reached; nor did it in a pretty while, if at all regain its *Luminouſneſs*.

5. As a *Quick-Coal* is not to be *Extinguiſh'd* by the Coldneſs of the *Air*, when that is greater than Ordinary; ſo neither is a piece of *Shining Wood* to be Deprived of its *Light* by the ſame Quality of the *Air*.

As much of this Obſervation as concerns the *Coal*, will be readily Granted, and for proof of the *Other* part of it, this one *Tryal* may ſuffice, which I ſhall now relate.

I took a ſmall piece of *Shining Wood*, and put it into a Slender Glaſs Pipe, *Sealed* at one end, and open at the other, and placed this Pipe in a Glaſs Veſſel, where I cauſed to be put a Strongly *Frigorifick* Mixture of *Ice* and *Salt*, and having kept it there full as long as would be Requiſite to *Freeze* an *Aqueous Body*, I afterwards took it out, and perceived not any ſenſible *Diminution* of its *Light*. But though the *Light* of *Shining Fiſh* be Uſually (as far as I have obſerved) more Vigorous and Durable than that of *Shining Wood*; yet I cannot ſay, that it will hold out againſt *Cold* ſo well as the other: For having ordered one of my Servants to cut off a good large piece of a *Luminous Whiting*, and bury it in *Ice* and *Salt*, when I called for it in leſs than *half* an *Hour* after, I found it much Stiffened by the *Cold*, and to have no *Light*, that I could diſcern in a place *Dark* enough. And for fear that this Effect may have proceeded not barely from the Operation of the *Cold*, but alſo from that of the *Salt*, I cauſed another time a piece of *Whiting* to be put in a Pipe of Glaſs *Seal'd* at one end, and having ſeen it *Shine* there, I looked upon it again, after it had ſtayed but a *Quarter* of an *Hour*, by my eſtimate, in a *Frigorifick* mixture, which the Glaſs kept from Touching the *Fiſh*; and yet I could not perceive in a *Dark* place, that it Retained any *Light*.

Differences.

1. The firſt *Difference* I obſerved betwixt a *Live Coal* and *Shining Wood* is, That whereas the *Light* of the *Former* is readily *Extinguiſhable* by *Compreſſion* (as is Obvious in the Practice of ſuddenly *Extinguiſhing* a piece of *Coal* by Treading upon it) I could not find that ſuch a *Compreſſion*, as I could conveniently give without loſing Sight of its Operation, would *Put-out*, or much injure the *Light*, even of ſmall Fragments of *Shining Wood*. One of my *Trials* about which I find thus ſet down.

I took a piece of *Shining Wood*, and having Preſſed it between two pieces of Clear Glaſs (whereof the one was pretty Flat, and the other Convex) ſo that I could clearly ſee the *Wood* through the Glaſs, I could not Perceive, that the *Compreſſion*, though it ſometimes broke the *Wood* into ſeveral Fragments, did either *Deſtroy* or conſiderably Alter the *Light*.

2. The next *Unlikeneſs* to be taken notice of betwixt *Rotten-Wood* and a *Kindled Coal* is, That the Latter will in very few *Minutes* be Totally *Extinguiſh'd* by the Withdrawing of the *Air*; whereas a piece of *Shining Wood*, being Eclipſed by the Abſence of the *Air*, and kept ſo for a Time, will Immediately *Recover* its *Light*, if the *Air* be let in upon it again within *Half* an *Hour* after it was firſt Withdrawn.

The *Former* part of this Obſervation is eaſily proved by the Experiments that have been often made upon *Quick Coals* in the *Pneumatical Engine*; and the Truth of the *Latter* part appears by the *Experiments* about *Shining Wood* mentioned above. Neither is it improbable, that if I had had conveniency to Try it *I* ſhould have found, that a piece of *Shining Wood*, Deprived of its *Light* by the Removal of the Ambient *Air*, would retain a diſpoſition to recover it upon the return of the *Air*, not only for *half* an *Hour*, but for *half* a *Day*, and perhaps a Longer Tme.

3. The next *Difference* to be mentioned is, That a *Live Coal* being put into a ſmall Cloſe Glaſs, will not Continue to *Burn* for very many *Minutes*; but a piece of *Shining Wood* will Continue to *Shine* for ſome Whole *Days*.

The *Firſt* part of the Aſſertion I know you will readily Grant: The Other part of it may be eaſily made out by what I have tried upon *Shining Wood*, Sealed up *Hermetically* in very ſmall Glaſſes, where the *Wood* did for ſeveral *Days* Retain its *Light*.

4. A *4th. Difference* may be this: That whereas a *Coal*, as it *Burns*, ſends forth ſtore of *Smoak* or *Exhalations*; *Luminous Wood* does not ſo.

5. A *5th.* Flowing from the former is, That whereas a *Coal* in *Shining* Waſts it ſelf at a great rate, *Shining Wood* does not.

Theſe *Two Unlikelineſſes* I mention together, becauſe what concerns the *Coal* in both, will need no Proof; and as for what concerns *Rotten Wood*, it may be Verified by an Obſervation, that I made in a piece of it *Hermetically Sealed* up in a ſmall Clear Glaſs, where after it had Continued *Luminous* ſome Days, *I* look'd on it in the *Day* time to perceive, if any ſtore of *Spirits* or other *Steams*, had, during all that while, *Exhaled* from the *Wood*, but could not find any on the Inſide of the Glaſs, ſave that in one place there appeared a Kind of *Dew*, conſiſting of ſuch very ſmall Drops that a Multitude of them would go to the making up of One Ordinary Drop. But in pieces of *Shining Fiſh* I found the Caſe much otherwiſe, as was to be expected.

6. The

6. The *Laſt Difference I* ſhall take notice of betwixt the Bodies hitherto compared is, That a *Quick Coal* is actually and vehemently *Hot*; whereas *I* have not obſerved *Shining Wood*, to be ſo much as ſenſibly *Lukewarm*.

What is ſaid of the *Coal's Heat*, being as manifeſt as its *Light*, *I* ſhall need only to make out what relates to the *Shining Wood*. To aſſiſt me wherein, *I* meet among my *Notes* this following.

I put upon a large Piece of *Wood*, which was partly *Shining*, and, as near as *I* could, upon one of the Moſt *Luminous* parts of it, one of thoſe *Thermoſcopes*, that *I* make with a *Pendulous Drop* of *Water*. But as *I* had formerly Tryed that by laying the Tip of my Noſe or Finger upon it, when it *Shone* Vividly enough, to enable me to *Diſcern* both the One and the Other at the time of a *Contact*, I could not perceive the leaſt of *Heat*, but rather an *Actual Coldneſs*; ſo by this Tryal I could not ſatisfie my ſelf, that it did viſibly raiſe the pendulous Drop, though the Inſtrument were ſo Tender, that by approaching one Finger near it, yet without actually Touching of it, it would manifeſtly be Impelled up, and upon the Removal of my Finger, would preſently Deſcend again.

And I remember, that having put ſuch an *Inſtrument* upon a *Shining Fiſh*, that was pretty Large, I could not thereby perceive, that it had any Degree of *Heat*, but rather the contrary: For having divers times taken off the Glaſs to apply it with the more Advantage to ſeveral parts of the *Luminous Fiſh*, I divers times took notice, that upon the Removal of the Glaſs into the *Air*, the *Pendulous Drop* would manifeſtly Riſe a little, and Subſide again when the Glaſs was applied to the *Fiſh*. But whether this part of the Experiment will hold in all Temperatures of the *Air*, I had not opportunity to Try.

VIII. The *Great Peer* is quite Demoliſhed and Fill'd up with *Rubbiſh*, and the *Rocks* that lay about 40 *Yards* off in the *Sea* at the *Peer-Head*, are Riſen Above-Water; ſo that there is no Hopes of making good that *Peer* again. And the *Ways* leading from that *Peer* to the *Quarry*, are turned Upſide down, and Sunk at Several Places about 30 *Foot*. Alſo the *Way* leading to the *North Peer*, is under the ſame Circumſtances: And the *Peer* Crack'd in ſeveral Places; which *Peer* with ſome Charge may be Repaired. The Earth is ſlid into the Sea between the 2 *Peers* near 100 *Yards*, and is yet working off into the *Sea*, whereby the Iſland is Damnified ſeveral *Thouſand Pounds*, beſides the Number of Poor People that Depend upon their Daily Labour in the *Quarry*; the Work ceaſing till Reparation be made, and continues yet Dreadful to behold. Which, as is Conjectured, proceeded from a Great Quantity of *Rubbiſh*, thrown over the *Cliff*, upon a *Clayiſh Foundation*, that by the Violence of Rain was made Soft, and Gave way: and not by an *Earthquake*, as ſome Report.

An Account of Damage *that happened at* Portland; *Feb.* 3. 169$\frac{5}{6}$. *communicated by Sir* Rob. Southwel. n. 231. p. 659.

The Death of a Dog on Firing some Volleys of Small shot; by Mr. Rob. Clarke. n. 235. p. 779.

IX. In *Nov.* 1697. Upon Proclaiming the Peace, *Two Troops* of *Horse* Dismounted, were drawn in a Line in order to Fire their *Volleys*. The Center of their Line was against a Butcher's Door, who kept a very Large *Mastiff Dog*, the biggest in our Town; a *Dog* of great Courage for Fighting. This *Dog* was laid by the Fire-side Asleep by the Servants: But upon the *First Volley* the Souldiers made, he immediately started up, Ran into a Chamber, and Hid himself under the Bed. The Maid Servant going to beat him Down, (he never using to go up Stairs) as she was about so doing a *Second Volley* came: Which made the Dog Rise, Run several times about the Chamber with violent *Tremblings*, and strange seeming *Agonies*. But immediately a *Third Volley* came: And then the *Dog* ran about Once or Twice, and fell down and *Died* immediately, with Throwing out *Blood* at *Mouth* and *Nose*.

To Preserve small Fœtus's; by Mr. R. Boile. n. 12. P. 199.

X. I long since presented the *Royal Society* with an Experiment of *Preserving Whelps* taken out of the Dam's Womb, and other *Fœtus*'s, or Parts of them, in *Spirit* of *Wine*. I have also Open'd *Hen's Eggs* at several Days after the Beginning of the *Incubation*, and carefully taking out the *Embryo's*, Embalmed each of them in a Distinct Glass (which is to be carefully Stopt) in *Spirit* of *Wine*; Which *I* did, that so *I* might have them in readiness, to make on them, at any time, the Observations, *I* thought them capable of affording. But *I* must not omit these 2 Circumstances; the *One*, that when the *Chick* was grown big, before *I* took it out of the *Egg*, *I* have, but not constantly, Mingled with the *Spirit* of *Wine*, a little *Spirit* of *Sal Armoniack*, made by the Help of *Quick Lime*: Which *Spirit* I chose, because, though it abounds in a *Salt* not *Sowre* but *Urinous*, yet *I* never observed it (how Strong soever *I* made it) to *Coagulate Spirit* of *Wine*. The *Other* Circumstance is, that *I* usually found it Convenient, to let the little Animals, *I* meant to *Imbalme*, lie for a little while in *Ordinary Spirit* of *Wine*, to Wash off the Looser Filth, that is wont to adhere to the *Chick*, when taken out of the *Egg*; and then, having put either the same kind of *Spirit*, or Better, upon the same *Bird*, *I* suffered it to Soak some time therein, that the Liquor having Drawn as it were what *Tincture* it could, the *Fœtus* being Removed into more *Pure* and well *Dephlegmed Spirit* of *Wine*, might not Discolour it.

A Microscopical Animal discovered; by S.... n. 42. p. 842.

XI. As we Examined with an Excellent Microscope some little *Grains* of Sand Searced, we perceived an *Animal* with *Many Feet*; its Back *White* and *Scaly*; but less than any of those hitherto observed: For although the *Microscope* shewed every *Grain* of Sand as big as an Ordinary *Nut*, yet this *Animal* appeared no bigger than one of those *Grains* of Sand seen without a *Microscope*.

Microscopical Observations; by Mr. J. Harris. n. 220. p. 254.

XII. *Jul.* 7. 1694. *I* examined a small Drop of *Rain Water*, that had stood in a Gally-pot in my Window for about 2 *Months*. *I* took it (with the

the Head of a ſmall Pin) from the *Diſcoloured* Surface of the Water, and in it *I* obſerved 4 ſorts of *Animals*. In the *Clear* part of the *Drop* were *Two* kinds, and both very Small. *Some* were of the Figure of *Ants Eggs*; theſe were in Continual Motion, and that very Swift: And I find that this kind of *Oval* Figure is the moſt Common to the *Animalcula* found in *Liquors*. The *other* ſort that were in the *Clear* part of the Drop, were much more Oblong; about 3 times as Long as Broad: theſe were Exceeding Numerous, but their Motion was *Slow*, in compariſon of the Former.

In the *Thick* part of the Drop (for the Water from whence *I* took it had contracted a *Thickiſh* Scum) *I* found alſo *Two* ſorts of *Animals*; as a kind of *Eels*, like thoſe in *Vinegar*, but much Smaller, and with their Extreams more ſharp. Theſe would Wriggle out into the *Clear* part, and then ſuddenly betake themſelves back again, and Hide in the *Thick* and *Muddy* part of the Drop, much like Common *Eels* in the Water. *I* ſaw here alſo an *Animal* like a large *Maggot*, which would Contract it ſelf up into a *Spherical* Figure, and then ſtretch it ſelf out again; the End of its *Tail* appeared with a *Forceps*, like that of an *Ear-wig*; and *I* could plainly ſee it Open and Shut its *Mouth*, from whence *Air-Bubbles* would frequently be Diſcharged. Of theſe *I* could number about 4 or 5 and they ſeemed to be buſie with their Mouths as if *Feeding*.

Theſe 4 *kinds* of *Living Creatures*, *I* found afterwards alſo in many other *Drops* of the ſame Corrupted Water (*i. e.*) in its *Film* or *Scum*, which was on the Surface: For under that, in the Lower parts of the Water, *I* could never find any *Animals* at all, unleſs when the Water was Diſturbed, and the Surface ſhaken down into, and Mingled with, the Lower parts.

Apr. 27. 1696. With a much better *Microſcope I* Examined ſome *Rain-Water* that ſtood Uncovered a pretty while, but had not Contracted any ſuch *Thick* and *Diſcoloured Scum*, as that before mentioned had. In this, where it was *Clear*, *I* could not find any *Animals* at all: But a little thin *White* Scum, that like Greaſe began to Appear on the Surface, *I* found to be a *Congeries* of exceeding ſmall *Animalcula* of Different Shapes and Sizes, much like thoſe produced by Steeping *Barley* in *Water*.

At the ſame Time I look'd on a ſmall drop of the *Green* Surface of ſome *Puddle-water*, which ſtood in my Yard: This I found to be altogether Compoſed of *Animals* of ſeveral Shapes and Magnitudes; But the moſt remarkable were thoſe which I found gave the Water that *Green* Colour, and were *Oval* Creatures, whoſe middle part was of a *Graſs-Green*, but each end *Clear* and *Tranſparent*. They would Contract and Dilate themſelves; tumble over and over many times togerher, and then ſhoot away like *Fiſhes*; their *Head* was at their Broadeſt end, for they ſtill Moved that way. They were very Numerous, but yet ſo large, that I could Diſtinguiſh them very plainly, with a Glaſs that did not *Magnify* very much. Among theſe were interſperſed many other ſmaller and *Tranſparent Animals*, like thoſe mentioned but now, as found in the *Whitiſh Skum* that was on ſome *Rain-water*, which had ſtood a while Uncovered.

Apr. 29. 1696. I found *another* ſort of *Creatures* in the *Water* (ſome of which I had kept in a Window, in an open Glaſs); They were as Large as *three* of the Other with the *Green* border about their Middles, but theſe were perfectly Clear and Colourleſs.

Then alſo Examining more Accurately the *Belts* or *Girdles* of *Green* that were about the *Animals* mentioned above, I found them to be Compoſed of *Globules*, ſo like the *Rowes* or *Spawn* of *Fiſhes*, that I could not but Fancy they ſerved for the ſame Uſe in theſe little *Creatures*: For I found now, ſince *Apr.* 27, many of them without any thing at all of that *Green Belt* or Girdle; others with it very much, and that Unequally, Diminiſhed, and the Water fill'd with a Vaſt Number of *Small Animals*, which before I ſaw not there, and which I now look'd on as the young *Animated Frye*, which the Old ones had ſhed. I continued looking on them at times, for 2 *Days*, during which time the Number of the Old Ones, with the *Green Girdles*, Decreaſed more and more; and at laſt I could not ſee one of them ſo encompaſſed, but they were all *Clear* and *Colourleſs* from End to End.

May 18. 1696. I looked on ſome of the Surface of *Puddle-Water*, which was *Blewiſh*, or rather of a *Changeable Colour* between *Blew* and *Red*: In a very ſmall Drop of which I found prodigious Numbers of *Animals*, and of Various Bigneſſes: But among thoſe were none with thoſe *Girdles* before mentioned, either of *Green*, or any other *Colour*.

I then alſo Examined the Surface of ſome Other *Puddle-water*, that lookt a little *Greeniſh*; and this I found ſtock'd with ſuch Infinite Numbers of *Animals*, that I never ſaw the like any where but in the *Genitura Maſculina* of ſome Creatures. Among theſe there were very many of a *Greeniſh* Colour; but they all Moved about ſo ſtrangely Swift, and were ſo near to each other, that though I Tired my Eyes, I could not Diſtinguiſh whether the *Green* Colour were all over their Bodies, or whether it were only round their Middle in *Girdles*, as before: But from the roundeſs of their Figure and their Smallneſs, I judge that they chiefly conſiſted of the young *Animated Spawn* of that kind of *Animals* I mentioned above. I found that the point of a Pin dip'd in *Spittle* would preſently *Kill* them all; as I ſuppoſe it will other *Animalcula* of this kind.

The ſame Day alſo I look'd on the Surface of ſome *Mineral* (*Chalybeate*) Water, which had ſtood in a Viol unſtopt for about 3 *Weeks*: In it I ſaw 2 *kinds* of *Animals*, *one* Exceeding ſmall, and the *other* very Large: Which *Latter* ſort had on the *Tail* ſomething that look'd like *Fins*. There were but very Few of either ſort.

The *Compounded Salt*, or *Vitriol* of the Water was *Shot* into pretty Figures, but all Irregular. They look'd all like a ſmall heap of little *Sticks*, laid a croſs each other at all Angles and Poſitions; only they were Tranſparent, and a little *Greeniſh* as *Chryſtals* of a *Chalybeate* nature uſe to be.

I Infuſed whole *Pepper Corns*, *Bay-berries*, *Oats*, *Barley* and *Wheat* in *Water*; whoſe *Skum*, after 2 or 3 *Days* afforded *Animals*, as hath been often already found by others, at leaſt as to ſome of them: But I found the Greateſt

Numbers

Numbers and Variety in *Wheat* and *Barley Water*, and the Feweſt in that wherein *Bay-berries* had been Steeped.

How ſuch vaſt Numbers of *Animals* can be thus (as it were at pleaſure) Produced, without having Recourſe to *Equivocal Generation*, ſeems a very great Difficulty to account for. But tho' the *Solving* of it that way makes ſhort work of the matter (for 'tis eaſie enough to ſay they are Bred there by *Putrefaction*) yet the Aſſerting *Equivocal Generation*, ſeems to me to imply more Abſurdities and Difficulties, than perhaps may Appear at firſt Sight: I wiſh therefore, that this matter would a while imploy the Thoughts of ſome Ingenious and Inquiſitive Man. In the mean time I've Conjectured, that theſe *Animalcula* may be *Produced* by one or both of the following Ways.

1. I have thought that the *Eggs* of ſome Exceeding ſmall *Inſects*, which are very numerous, may have been laid or Lodged in the *Plicæ* or *Rugæ* of the *Coats* of the *Grain*, by ſome Kinds that inhabit on thoſe *Seeds*, as their Proper places. For that *Inſects* of the Larger Kind, do frequently thus Depoſite their *Eggs* on the *Flowers* and *Leaves* of *Plants*, is often Experimented; and 'tis very probable, that the Smaller or *Microſcopical Inſects* do the ſame. Now theſe being Waſhed out of the *Seeds*, by their immerſion in Water, may Riſe to the Surface, and there be *Hatch'd* into thoſe *Animals* which we ſee ſo plentifully to Abound there.

2. Or the Surface of the Water may Arreſt the Straggling *Eggs* of ſome *Microſcopical Inſects*, that perhaps were about in the *Air*, and being Fitted and Prepared for this purpoſe, by the Infuſion of Proper *Grain*, or a Proportionable Degree of *Heat*, may compoſe ſo Proper a *Nidus* for them, that they may by the warmth of the *Sun* be eaſily Hatched into *Living Creatures*; which its Probable (like the ſtrange *Water Inſect*, from whence a *Gnat* is Produced, mentioned by the Learned Dr. *Hook* in his *Micrographia*, whoſe *Metamorphoſis I* have often with pleaſure ſeen) may afterwards Turn into *Flies* or *Winged Inſects* of the ſame *Species* with the *Animal Parent*. And perhaps ſometimes both theſe Circumſtances, and others of the like Nature, Concur for their *Production*.

XIII. I have Obſerved in *Hemiſphærules* of *Water*, duely apply'd to the *End* of a *Wire*, 2 ſorts of *Microſcopical Inſects*, *Globular* and *Eliptical*.

Microſcopical Animals; by *Mr.* Steph. Gray. n. 221. p. 283. *Vid. Vol.* I. *Chap.* III. *Sect.* XXIV.

Thoſe of a *Globular* Form are but a little leſs Tranſparent than the *Water* they Swim in; they have ſometimes Two *Dark Spots* Diametrically oppoſite, but theſe are Rarely ſeen; there are ſometimes Two of theſe *Globular Inſects* ſticking together; where they are Joyned 'tis Opacous, poſſibly they may be in the Act of *Generation*. They have a Two-fold Motion, a Swift *Progreſſive* Irregular one, and at the ſame time a *Rotation* on their Axes at Right Angles to the Diameter that has the *Dark Spots*: But this is ſeen only when they Move Slowly. They are almoſt of an Incredible *Minuteneſs*.

I have examined many *Tranſparent* Fluids, as *Water*, *Wine*, *Brandy*, *Vinegar*, *Beer*, *Spittle*, *Urine*, *&c.* And do not remember to have found any of them

them without more or leſs of the Bodies of theſe *Inſects*; but *I* have not ſeen any in Motion except in *Common Water* that has ſtood for ſometimes a Longer, at others a ſhorter Time, as has been obſerved by M. *Leewenhoeck*; tho' *I* do not remember he has Obſerved that they are exiſtent in the *Water*, before they Revive. In the *River*, after the *Water* has been Thickened by *Rain*, there are ſuch Infinite Numbers of them, that the Water ſeems in great part to Owe its *Opacity* and *Whiteneſs* to theſe *Globules*. *Rain-water*, ſo ſoon as it falls has many, and *Snow-water* has more, of theſe *Globules*. The *Dew* that ſtands on Glaſs Windows has them; and for as much as *Rains* and *Dews* are continually Aſcending, or Deſcending, *I* believe we may ſay the *Air* is Full of them; they ſeem to be of the ſame *Specifick Gravity* with the *Water* they ſwim in, the *Dead* remaining in all parts of the *Water*; of many *Thouſands* that *I* have ſeen, *I* could Diſcern no ſenſible Difference in their Diameters, they appearing of Equal Bigneſs; in *Water* that has been *Boyled*, they retain their *Shapes*, and will ſometimes *Revive*.

There is another ſort of *Inſects I* have this way ſeen, but theſe are not ſo Frequently (at leaſt this Winter Seaſon) to be found; they are much longer than the former; they can Transform themſelves into Many Shapes; they are for the moſt part *Elliptical*, but ſometimes they Contract themſelves ſo as to be almoſt *Globular*; and ſometimes they Extend themſelves ſo, as to be Twice or Three times Longer than Broad, theſe ſometimes Turn themſelves *Round* on their Axes and Diameters as they go; they conſiſt of *Tranſparent* and *Opacous* parts.

Obſervations on the Animalcula *in* Pepper-water, *&c*; *by Sir* Edm. King. n. 203. p. 861.

XIV. 1. Having ſteep'd *Oates* in *Rain water*, ſome *Days* (perhaps 9 or 10) and looking upon it with my Bare Eye, *I* ſaw a Subſtance, that ſeemed to me like that uſually call'd a *Mother* (on other Liquors); and laying as much of it as a ſmall Pin's Head upon the *Object Plate* of my Beſt *Microſcope*, *I* could very eaſily and plainly diſcern 7 or 8 ſorts of *Animalcula*, of different *Sizes* and *Shapes* (or more) Swimming in this Subſtance. Their Shapes and Sizes were after this manner, as near as *I* could gueſs. They were all very *Nimble* in their Motions, by Computation, ſeveral *Thouſand* times *Magnified*.

Fig. 78.

2. The Thin Scum upon a *Pepper-water*, that did reſemble *Flakes* of *Salt* upon ſome ſorts of Humane *Urine*, applyed in the ſame manner to the *Object Plate* of the Microſcope, was only Cluſters of *Animalcula*, that had Liquid Matter enough to ſwim in; and *I* was in Admiration at their Numbers, Motions, Variety and Minuteneſs.

3. In a Decoction of *Herbs*, that was ſtrained, and ſet by for a particular Uſe; In a little of the ſettling of that (as much as a Pin's Head) I ſaw Creatures like little *Eeles*, about *Thus Long*, and ſeemed to be as Thick, but much Sharper at both Ends, with a Wriggling Motion, like *Eels*.

Fig. 79.

4. I obſerve theſe ſmall Creatures abovementioned (if I may ſo call them) Reſemble the Nature of *Fiſh*, in ſeveral Reſpects.

Firſt,

First, They'll Flock together, and lye close together, as if they were in *Sholes*, like *Carps* in a *Pond*, that has been so shallow, as I have often seen, sometimes in one place, sometimes in another, but when Disturb'd, they are as to your Sight, all dispersed and lost in a Trice: And so are these little Creatures in their Original Liquor, if you shake the Liquor before you look to find them in *Sholes*, or after; At least I am sure I did, and could never find any in that parcel of Liquor, till Next Day, or till they did *Associate* again.

2*dly*, They will follow their Liquor, to Act in, to the last Particle of it, till they have no more to *Swim* in, and then will seem to Struggle for want on't, till their Strength fails them, and then after a *Minute*, they will seem *Dead* upon the *Object Plate*, (when the watry parts are Dried away.)

3*dly*, They will lye as if they were *Dead*, near *half* an *hour* or more, then put a little *Water* to them, in *half* a *Minute* they will begin to Move themselves again, and by Degrees begin to *Swim* Faintly and Feebly at first (as *Fish* will do,) then Recovering their *Strength* again, will perform their Brisk Motions as Vigorous as ever.

4*thly*. Those that are Almost Dead will look *Flat*, as if Prest Thin, but when they Move, Turn themselves over and over, without any Regular Motion; so that you might see them as *Thin*, as the Thinnest Spangle you ever saw, and like it in Shape; and they will continue so, so long as they are Faint and Sick: But within about an *hour's* time they will grow Plump and well again, if you Add Fresh Liquor to them in time.

These *Animalcula* choose for the most part, the Top of the Liquor; I suppose for the sake of the *Air*.

If you perceive them lye *Dead* upon the *Object Plate*, as I did, and do not remember to Add *Water* to Revive them, within an *hour*, they will be Dead indeed: But you may see them in the *Posture* you Left them, many *Days* after.

Now to give a farther Testimony, that they are *Animalcula*, which some doubt, I have Noted the following Observations;

If you take a fine Needle, and put the point into *Spirit* of *Vitriol*, tho' you can see none of the *Spirit* with your *Bare Eye* upon its Point when you take it out, yet if you prick the same point of that *Needle* into the middle of that *Drop*, no bigger than a small Pin's-Head, when some *hundreds* of these *Animalcula* are *Swimming* very nimbly Frisking about, you shall immediately see these *Minute Creatures* (if I may so call them) presently Affected from the *Acid* Particles, so as to *Spread* themselves, and Tumble down seemingly *Dead*. *Fig.* 80.

If you dissolve *Salt*, and with the point of the same Needle, repeat the Experiment (in the same manner) in some of the same Liquor that contains some of the same parcel of *Animalcula*, you shall see the *Creatures* aforementioned, be Affected too, Stop in their Motion, but in another manner quite; not spread Flat, as those with *Spirit* of *Vitriol* did, but shrink Long and Round, in Form and Figure of that we call (whole *Oat-meal*, or) an *Excorticated Oat*. And whereas the First with the *Spirit* fell down Flat without Turning; these, as soon as Affected, turn Round and Round, when they begin to be Sick, and Wobble,

Wobble, as we ſay, before they fall down to the bottom and *Die*, unleſs you quickly recover them with freſh Water, and then you will perceive them get a New Life by degrees.

Tincture of *Salt* of *Tartar* put into them in the ſame manner *Kills* them more Immediately; but yet they will be firſt ſo *Sick*, or ſo Affected, call it what you pleaſe, as you may ſee by a ſurpriſing *Convulſive* Motion, they will grow Faint and Languid apace; as you may ſee them fall to the Bottom of the *Drop* upon your Object Plate *Dead*, but in their Own *Shape*, as they were before you applied your Needle, and will neither be *Flat* as with *Spirit* of *Vitriol*; nor *Cylindrical*, as with *Common Salt* Liquor.

Inks Kill them as ſoon as *Spirit* of *Vitriol*, but makes them ſeem to Shrink divers ways; I ſuppoſe by the *Solution* of *Copper* which is in its Compoſition.

Blood (newly preſt from a Prick purpoſely made in your Finger) *Kills* them almoſt as ſoon as *Spirit* of *Vitriol*; by reaſon, (I ſuppoſe) of the *Salt* therein: But it's a Fine and Surpriſing Sight, to obſerve them *Swiming* and Buſtling, firſt among the *Globules* of the *Blood* Juſtling one another, like *Fiſh* that are ſuddenly Deprived of *Water*, and Buſtle together amongſt *Mud*; for ſo they appeared to me.

Urine Kills them too, in a Little Time, tho' not ſo ſoon.

Sugar Diſſolved like *Salt* Kills them alſo, if uſed in the ſame manner, and with that ſome Dye *Flat*, and ſome Dye *Round*.

Sack will Kill them, but not ſo Speedily as the other Liquors.

Miſcellaneous Experiments; by Sir Rob. Southwell. n. 238. p. 87.

XV. For *Red*, *Tinctura Roſarum* 6 Spoonfulls.

For a *Higher Red*, *Syrupus Florum Punicorum*, One Spoonful; either of theſe to be Mixed with 5 of Ordinary *Water*.

For *Violet*, One Spoonful of *Syrup* of *Violets* to 5 Spoonfuls of *Water*.

Then to *Change* the *Roſe Colour* into *High Green*, R. *Oleum Tartari per deliquium*, waſh herewith the Inſide of the Glaſs, leaving a few Drops at the bottom, and then pour in the ſaid *Roſe Tincture*, and it will Change.

To make the *High Red Black*; Diſſolve half the bigneſs of a *Walnut* of *Sal Armoniack* in a Glaſs of Water, pour all out but 3 or 4 Drops in the Bottom, if the ſaid *Red* be put hereinto, it turns as *Black* as *Ink*.

To make the *Violet Red*; Waſh the Glaſs with the *Spirit* of *Vitriol* in manner aforeſaid, and pour therein your *Violet Water*.

To make *Red Wine Yellow* as *Sack*; Steep in *White Wine*, *Brazil Wood* 24 *Hours*, or elſe in Ordinary Water, till it looketh *Red*, and pour the ſame into a Glaſs Waſhed with *Vinegar*, it grows preſently *Yellow*.

To make this *Yellow White*; R. *Styrax Calamita* and *Benjamin*, *half* an *Ounce* of each, Pulverize it and ſteep it in 4 *Ounces* of *Aqua Vitæ*, of which a few drops will turn the Liquor *White*.

Note; This maketh the *Lac Virginis* for the Common *Waſh*.

Waſhing with *Clear Water*, to make the Hands and Face *Black*.

Beat *Galls* into very Fine Powder, and ſtrew it very well and Rowl it up and down into a *Towel*, then into a Baſon of *Water* throw ſome *Roman Vitriol*,

Vitriol, which will ſoon Diſſolve; and after the Party hath Waſhed therein, it being *Clear* and Without Smell, as ſoon as they Wipe with the Towel all the *Skin* grows *Black*. But in ſome Days, Waſhing it with *Soap*, it will come off.

To Renew the *Luſtre* of *Chryſtal*; Boil your Chryſtal in Fair Water, for a *Quarter* of an *Hour*, and to a Proportion of 6 *Quarts* of Water, add one *Quart* of *Brandy Wine*, letting the ſame continue to Boil *half* an *Hour* more; then take it out, and with the ſame Liquor Rub it all over throughout with a Bruſh; and then Dry it with a clean Warm Napkin, Rubbing it in every part, and it will regain its former *Luſtre*.

To make the *Hair* Grow; Take the *Roots* of *Bur-dock*, or what they call *Cuckolds-Burs*, which ſtick on the Cloaths, of the Largeſt Size in *December*; Boyl them in *French White Wine* 8 Fingers High, till half be conſumed: Waſh the *Head* herewith, being Warmed at Night, and it makes the *Hair* come out, in caſe the *Roots* be good.

Another; Make a *Lye* of the *Aſhes* of *Vines*, and Waſh the Head therewith, being Warm.

To hinder the *Hairs* from *Falling*; Put *Vine-Aſhes* in *Red Wine* of *France*, and then Filter all, and with that Liquor waſh the *Head* Warm.

Memorandum; The Powder of *Hermodactiles* uſed in the *Hair*, as common *Powder*, does the ſame thing.

Pour faire du *Feu Bleu*; Faites vous faire de *Meſches* aupres d'un *Cordier*, qui ne ſoit pas trop fortement Tordues. Fondez du *Soulfre* dans un pot à *Feu* de *Charbons*, trempez les *Meſches* dedans Trois ou Quatre fois ſelon que vous les aimerez d'avoir Groſſes. Pour en Repreſenter donc une Figure, on l'ebauche ſur des Planches, puis on y Attache en ſuivant ces Traces les *meſches* avec des Cloux, & les rend un peu Rabotteuſes en les battant avec un Marteau, a fin que la matiere ſuivante y tienne tant mieux. Celà fait, prenez de l'*Eau de Vie* forte, Meſlez y de la *Poudre à Canon* en Farine, tant que tout ſoit en Conſiſtence d'une bouill & frottez en les *Meſches* avec un Pinieceau, & eſpardez encore deſſus de la *Poudre* en Farine. Ainſi on laiſſe le tout Secher, & il ſerà Preparè à l' Uſage.

XVI. Take of ſmall Thin *Copper* pieces, clean'd in the Fire ℥j. of *Aqua Fortis* ℥iij. which being put together in a Glaſs, the *Copper* in 3 or 4 Hours will be diſſolved; When 'tis Cold you may uſe it, by Waſhing with a Feather upon your *Iron*, that is made Clean and Smooth, and it will preſently take the Colour of *Copper*; when it cometh out with Rubbing you may renew it again, but if you do it *Twice* together, the *Iron* will look *Black*.

To give Iron a Copper Colour; by Sir Robert Southwell. n. 243. p. 296.

XVII. Beat a *Ducket* Thin, and Diſſolve it in Two *Ounces* of *Aqua Regia*, then dip therein a clean *Rag*, and let the ſame Dry, and do it again and again till all the ſaid Liquor be Soaked up; then burn the ſaid Rag, and with the Tinder thereof let *Silver* be rub'd, uſing therewith a little Spittle,

To Guild Gold upon Silver; by Sir R. Southwell n. 243. p. 296.

and if by Chance the *Silver* will not take, then hold it to the Fire to take away all manner of Greaſe, and it will not fail.

Memorandum; This Method is known to very few *Goldſmiths* in *Germany*.

To Paint Glaſs in Marble Colours; *by Sir* Robert Southwell. n. 245. p. 364.

XVIII. 1. Grind well upon a *Stone* ſome *Minium* for *Red*.
2. *Radix Curcumæ*, or rather *Ceruſſa Citrina* for *Yellow*
3. *Smalt* for *Blew*.
4. *Verdegreaſe* for *Green*.
5. *Ceruſſe*, or *Chalk*, for *White*.

Which being all ſeparately wrought in *Oyl*, take a Bruſh of Hog's Hair, dipt in any of the ſaid *Colours*, and it will, being Rowled in your Hand, Scatter the ſame upon the Glaſs; then with your *Pencil* Work them together as you think fit; and laſtly, fling a little *Meade* amongſt them, which covers all.

An Imitation of China Diſhes; *by* ..... n. 7. p. 127.

XIX. S. *Septalio*, a Canon in *Milan*, hath the Secret of making as good *Porcelane* as is made in *China* it ſelf, and *Tranſparent*.

The Chineſe *way of making* Gold Thread; *by Dr.* Hans Sloan. n. 250. p. 71.

XX. The *Chineſe* Guild Paper on One ſide with *Leaf Gold*, then cut it in Long Pieces; they then *Weave* it into their *Silks*, which makes them, with little or no Coſt, look very Rich and Fine. The ſame Long pieces are Twiſted or Turn'd, about *Silk Thread* by them, ſo Artificially, as to look Finer than *Gold Thread*, tho' it be of no Great Value.

To Counterfeit Opal; *by Mr.* S. Colepreſſe. n. 38. p. 743.

XXI. I have been two Days at *Harlem* on purpoſe to ſee the Experiment of the making of *Counterfeited Opal-Glaſs*; It is very lively, I confeſs, and as I gueſs, performed only by the *Degrees* of *Heat*, Producing the *Colours*. When the Compoſition is throughly Melted, they take out ſome on the Point of an *Iron-rod*, which being Cool'd either in the *Air* or *Water*, is Colourleſs and Pellucid; but being put into the *Mouth* of the *Furnace* on the ſame Rod, and there Turned by the hand for a little Space, hath its little Bodies ſo Variouſly Poſited in ſeveral parts of the ſame Piece, as that the Light falling on them, being variouſly *Modified* thereby, Repreſents thoſe ſeveral Colours that are ſeen in the True *Opal*. Whether it be the Greateſt, or Leaſt Degree of *Heat*, that renders it a *White Opake* Body, I have let ſlip; but this I know, (which ſeems remarkable) that the *Colours* of it may be Deſtroyed and Reſtored according to the Various Motions (I ſuppoſe) of its Particles by *Heat*.

Some Obſervations touching Colours & Dyes; *by Dr.* M. Liſter. n. 70. p. 2132.

XXII. Two things, I conceive, are chiefly aimed at in the Inquiry of *Colours*; the *one*, to Encreaſe the *Materia Tinctoria*, and the *other*, to *Fix*, if poſſible, thoſe *Colours* we either have already, or ſhall hereafter Diſcover, for uſe. As to the *Firſt*, *Animals* and *Vegetables*, beſides other Natural Bodies, may abundantly furniſh us; And in both theſe kinds ſome *Colours* are *Apparent*, as the Various Colours of *Flowers*, and the Juices of *Fruits*, *&c.* and

&c. and the *Sanies* of *Animals*; others are *Latent*, and Discovered to us by the Effects the several Families of *Salt*, and other things, may have upon them. Concerning the *Apparent Colours* of *Vegetables* and *Animals*, and the various Effects of different *Salts* in Changing them from One Colour to another, we may have many Instances in Mr. *Boyle*. And if we might, with the good leave of that Honourable and Learned Person, Range them after our Fashion, we should give you at least a New Prospect of them, and observe to you the Conformity and Agreement of the Effects of *Salt* on the divers Parts of *Vegetables*: *Viz.*

1. That *Acid Salts* Advance the *Colours* of *Flowers* and *Berries*; that is, according to the Experiments of Mr. *Boyle*, they make the *Infusions* of *Balaustium* or *Pomgranat-Flowers*, *Red-Roses*, *Clove-jilly-Flowers*, *Meserion*, *Pease-bloom*, *Violets*, *Cyanus-Flowers*, of a *Fairer Red*; also the *Juices* of the *Berries* of *Ligustrum*, of *Black Cherries*, *Buck-thorn-Berries*, of a much *Fairer Red*: and to the same Purpose *Acid Salts* make no great Alterations upon the *White Flowers* of *Jasmin* and *Snow-drops*. 2. That *Urinous Salts*, and *Alcaly*'s, on the contrary, quite Alter and Change the *Colours* of the same *Flowers* now named, and the *Juices* of the said *Berries* also from *Red* to *Green*; even *Jasmin* and *Snow drops*. 3. Again, that in like manner *Urinous Spirits* and *Alcaly*'s Advance, at least do not quite Spoyle the *Colours* of the *Juices* of *Leaves* of *Vegetables*, of their *Wood* and *Root*. Thus Mr. *Boyle* tells us, that *Urinous Spirits* and *Alcaly*'s make the *Yellow* Infusions of *Madder-Roots*, *Red*; of *Brazil-wood*, *Purplish*; of *Lignum Nephriticum*, *Blew*; the Red Infusion of *Log-wood*, *Purple*; of the *Leaves* of *Sena*, *Red*. 4. That on the contrary, *Acid Salts* quite Alter and Change the said Infusions from *Red* or *Blew*, to *Yellow*.

In the next place we would Note to you the Effects of *Salts* upon *Animals*, in the Production and Change of *Colours*: But the Instances are very Few or none, that I meet with in any Author; the *Purple-Fish* being quite out of Use; and *Cochineil* and *Kermes* are by most Questioned, whether they are *Animals* or no; but I think, we may confidently believe them both to be *Insects*, that is, *Worms* or *Chrysalys*'s of respective *Fly's in proxima Fœtura*. We find then, and have Tried concerning *Cochineil* (which of it self is *Red*,) that upon the Affusion of the *Oyl* of *Vitriol*, that is an *Acid Salt*, it Strikes the most *Vivid Crimson* that can be Imagined; and with *Urinous Salts* and *Alcaly's*, it will be again Changed into an Obscure Colour 'twixt a *Violet* and a *Purple*. *Vid. Vol.* II. *Chap.* VI. Sect. LIX. & Sect. XI. & Sect. XXVIII.

Concerning the *Apparent Colours* in *Flowers*, we think we may assert; 1. That generally All *Red*, *Blew* and *White Flowers* are immediately, upon the Affusion of an *Alcaly*, Changed into a *Green Colour*, and then, in process of no long time, turned *Yellow*. 2. That all the Parts of *Vegetables*, which are *Green*, will in like manner strike a *Yellow* with an *Alcaly*. 3. That what *Flowers* are already *Yellow*, are not much Changed, if at all, by an *Alcaly* or *Urinous Spirit*. 4. The *Blew Seed-husks* of *Glastum Sylvestre* Old gathered and Dry, diluted with Water, stain a *Blew*, which upon the Affusion of *Lye* strikes a *Green*; which *Green* or *Blew* being thus Touched

with the *Oyl* of *Vitriol* Dyes a *Purple*. All theſe 3 *Colours* ſtand. 5. On the Tops of *Muſcus Tubuloſus*, ſo call'd by Mr. *Ray* in his late *Catalogue* of the *Plants* of *England*, are certain *Red* knots; theſe, upon the Affuſion of *Lye*, will ſtrike a *Purple*, and ſtand.

As for the *Latent Colours* in *Vegetables* and *Animals*, to be Diſcovered to us by the Affuſion of *Salts*; they likewiſe, no Doubt, are very many. We will ſet down only a Few Inſtances in both kinds, which have not been, that we know of, Diſcovered or taken notice of by others. 1. *Latent Vegetable Colours*. 1. The *Milky Juice* of *Lactuca Sylveſtris coſtâ Spinoſa*, and *Sonchus Aſper* and *Levis*, upon the Affuſion of *Lye*, will ſtrike a Vivid *Flame-Colour*, or *Crimſon*, and after ſome time quite Degenerate into a Dirty *Yellow*. 2. The *Milk* of *Cataputia minor*, upon the Affuſion of *Lye*, eſpecially if it be drawn with a Knife, and hath any time ſtood upon the blade of it, will ſtrike a *Purple* or *Blood-Red-Colour*, and by and by Change into an Ignoble *Yellow*. 2. *Latent Animal Dyes*. 1. The Common *Hawthorn-Caterpillar* will ſtrike a *Purple*, or *Carnation*, with *Lye*, and Stand. 2. The Heads of *Beetles* and *Piſmires*, *&c.* will with *Lye* ſtrike the ſame *Carnation-colour* and Stand. 3. The *Amber-coloured Scolopendra* will give with a *Lye* a moſt Beautiful and Pleaſant *Azure* or *Amethyſtine*, and Stand.

Laſtly, we might conſider the *Fixing* of *Colours* for uſe: but we are willing to leave this to more Experienced Perſons. Some obvious Inferences however we may Venture to take Notice of. 1. That in all the Inſtances above mentioned, whether *Vegetable* or *Animal*, there is not one *Colour* Truly *Fixed*; I ſay, Truly *Fixed*, that is, Proof of *Salt* and *Fire*: For, what ſeems to Stand and be *Lye-Proof*, are either wholly Deſtroyed by a Different *Salt*, or Changed into a much Different *Colour*; which muſt needs prove a *Stain* and Blemiſh, when it ſhall happen in the Uſe of any of them. 2. That both the *Apparent* and *Latent Colours* of *Vegetables* are *Fixable*: An Inſtance whereof we may obſerve in the *Seed husks* of *Glaſtum*; and the Uſe *Dyers* make of the *Leaves* after due Preparation. 3. It is probable from the ſame Inſtance, that we may learn from the *Colour* of ſome part of the *Fruit* or *Seed*, what *Colour* the *Leaves* of any *Vegetable* and the *Whole Plant* might be made to Yield for our *Uſe*. 4. That the *Latent Colours* of *Vegetables* are Præ-exiſtent, and not Produced; from the ſame Inſtance of *Woad*, and likewiſe from this that the *Milky Juice* of *Lactuca Sylveſtris* doth afford it ſelf a *Red Serum*. 5. That the *Change* of *Colours* in *Flowers* is Gradual and Conſtant. 6. That the *Colours* of *Flowers*, which will not Stand with *Lye*, ſeem to be wholly Deſtroyed by it, and Irrecoverable. Thus it happens in the Experiment, that one part of a *Violet Leaf*, upon the Affuſion of *Lye*, is *Changed* very ſoon into *Yellow*, and will never be Revived into a *Red* by any *Acid Salt*; but if another part of the ſame *Leaf* be ſtill *Green*, it will be Revived. 7. That the Dryneſs ſeems to be a Means, if not of *Fixing*, yet bringing the *Vegetable Colour* into a Condition of not Wholly and Suddainly Periſhing by the otherwiſe Deſtroying *Alcaly*. 8. That thoſe *Plants* or *Animals* that will Strike Different and

yet

yet Vivid *Colours* upon the Affuſion of *Different Salts*, and Stand, as the *Cochiniel* and *Glaſtum*, are probably of all others to be reckoned as the beſt Materials.

XXIII. The *Pelt* being taken off is firſt Streined by Lines on a ſort of *Rack* to Dry them. And the *Brains* of the *Deer* is taken out and Meſſed and Dawbed on Moſs or Dryed Graſs, and then Dryed in the Sun, or by a Fire to Preſerve them.

The Weſt-Indian *Way of Dreſſing* Buck *and* Doe Skins; *by Sir* Rob. Southwell. n. 194. p. 532.

When the *Hunting-Time* is over the *Women* (for the *Men* never do it) *Dreſs* the *Skins*; firſt, by putting them in a Pond, or Hole of Water, to *Soak* them well; then with an old Knife fixt in a Cleft Stick, they force off the *Hair*, whilſt they remain Wet. The *Skins* being thus Prepared, they put them and a Proportion of the *Dryed Brains* into a Kettle over a Fire, till they are more than *Blood-warm*; which will make them *Ladder* and Scour perfectly Clean; which done, they with ſmall Sticks Wreſt and Twiſt each *Skin* as long as they find any *Wet* to Drop from them, letting them remain ſo Wreſted ſome *Hours*; and then they Untwiſt each *Skin*, and put them into a ſort of a *Rack*, like a *Clothier's Rack*, (which they fix at every place they come to, with no more trouble than Two ſmall Poles ſet Upright, and Two more put Athwart, all fixed with their own *Barks*,) and Extend them every way by Lines, and as the *Skin* Dries, ſo they with a Dull *Hatchet*, or a *Stick* Flatted and brought to a Round Edge, or a *Stone* fitted by Nature for that Purpoſe, rub them all over, to force all the Water and *Greaſe* out of them, till they become perfectly *Dry*. This is all they do: And one *Woman* will *Dreſs* 8 or 10 *Skins* in a *Day*; that is, Begin and End them.

XXIV. 'Tis a conſiderable Advantage which thoſe have who want their *Eye-ſight*, as to *Memory*, and the Application thereof: For we who have our *Eye-ſight* can with more Advantage Apply our *Memory* (in Matters of Intent conſideration) by *Night*, in the *Dark*, when all things are Quiet, than by *Day*, when *Sights* and Noiſes are apt to Divert our Thoughts; and even by *Day* we may better do it with our *Eyes ſhut*, than *Open*.

The Strength of Memory; *by J.* Wallis. n. 178. p. 1269.

I had the Curioſity many *Years* ago to Try how far the *Strength* of *Memory* would ſuffice me to perform ſome *Arithmetical* Operations (as *Multiplication*, *Diviſion*, *Extraction* of *Roots*, *&c.*) without the Aſſiſtance of *Pen* and *Ink*, or ought Equivalent thereto: And I found it to ſucceed in Numbers of 20. 30. or 40. *Places*. Particularly *Dec.* 22. 1669. (by *Night* in the *Dark*) I Extracted the *Square Root* of 3. to the 20*th*. *Place* of *decimal Fractions*. And at the Requeſt of a *Foreigner*, *Feb.* 18. $167\frac{2}{1}$ (by *Night* in *Bed*, and without any other Aſſiſtance than my *Memory*) I propoſed to my ſelf a Number of 53. *Places*, and found its *Square Root* to 27 *Places*; And (having Fixt them in my *Memory*, by Repeating the ſame Operation a Night or two after) at his next Viſit, *Mar.* 11. following, I Dictated to him the *Numbers* from my *Memory*, not having Committed them to *Writing* before.

By

By which I am ſufficiently ſatisfyed that a Reaſonable good *Memory*, fixt with good *Attention*, is capable of being Charged, with more, than a Man would at Firſt Imagine.

The Credibility *of* Humane Teſtimony; *by* ..... n. 257. p. 359.

XXV. *Moral Certitude Abſolute*, is that in which the Mind of Man entirely Acquieſces, requiring no further Aſſurance. As if one, in whom I *Abſolutely Confide*, ſhall bring me word of 1200 *l.* accruing to me by Gift, or a Ship's Arrival; and for which therefore I would not give the Leaſt Valuable Conſideration to be Enſured.

Moral Certitude Incompleat, has its ſeveral *Degrees* to be eſtimated by the *Proportion* it bears to the *Abſolute*. As if one, in whom I have that *Degree* of *Confidence*, as that I would not give above *one* in 6 to be *Enſured* of the Truth of what he ſays, ſhall Inform me, as above, concerning 1200 *l.* I may then Reckon that I have as good as the *Abſolute Certainty* of 1000 *l.* or *five Sixths* of *Abſolute Certainty* for the whole Sum.

The *Credibility* of any *Reporter* is to be Rated, 1. by his Integrity, or *Fidelity*; and 2. by his *Ability*. And a Double *Ability* is to be conſidered; both that of *Apprehending* what is Delivered, and alſo of *Retaining* it afterwards, till it be Tranſmitted.

What follows concerning the *Degrees* of *Credibility*, is Divided into 4 *Propoſitions*. The *Two firſt* reſpect the *Reporters* of the Narrative, as they either *Tranſmit* Succeſſively, or *Atteſt* Concurrently: The 3*d.* the *Subject* of it; as it may conſiſt of ſeveral Articles: and the 4*th.* Joyns thoſe 3 Conſiderations together, Exemplifying them in *Oral* and in *Written Tradition*.

Prop. I. *Concerning the* Credibility *of a* Report, *made by* Single *Succeſſive* Reporters, *who are equally* Credible.

Let their *Reports* have Each of them, *Five Sixths* of *Certainty*; and let the *Firſt Reporter* give me a *Certainty* of 1000 *l.* in 1200 *l.* It is plain that the *Second Reporter*, who Delivers that *Report*, will give me the *Certainty* but of $\frac{5}{6}$ of that 1000 *l.* or the $\frac{5}{6}$ of $\frac{5}{6}$ of the Full *Certainty* for the whole 1200 *l.* And ſo a 3*d. Reporter*, who has it from the 2*d.* will Tranſmit to me $\frac{5}{6}$ of that *Degree* of *Certainty*, the 2*d.* would have Delivered me; *&c.*

That is, if *a.* be put for the Share of *Aſſurance* a Single *Reporter* gives me; and *c.* for that which is Wanting to make that *Aſſurance* Compleat; and I therefore ſuppoſed to have $\frac{a}{a+c}$ of *Certainty* from the *Firſt Reporter*, I ſhall have from the *Second*, $\frac{aa}{a+c^2}$ from the 3*d.* $\frac{a^3}{a+c^3}$. *&c.* And accordingly if *a.* be = 100. and *c* = 6. (the Number of *Pounds* that an 100 *l.* put out to *Intereſt* brings at the *Year's* End) and conſequently my Share of *Certainty* from *One Reporter*, be = $\frac{100}{106}$ (which is the Preſent Value of any *Sum* to be paid *One Year* hence) the Proportion of *Certainty* coming

ing to me from a 2*d.* will be $\frac{100}{106}$ *Multiplied* by $\frac{100}{106}$, (which is the Preſent Value of *Money* to be paid after *Two Years*;) and that from a 3*d.* Hand *Reporter* $= \frac{100}{106}$, thrice *Multiplied* into it ſelf; (the Value of Money payable at the end of 3 *Years*,) *&c.*

Corollary. And therefore, as at the *Rate* of *6 per Cent.* Intereſt the Preſent *Value* of any *Sum* Payable after 12 *Years*, is but *Half* the *Sum*: So if the *Probability* or Proportion of *Certitude* Tranſmitted by each *Reporter* be $\frac{100}{106}$. the Proportion of *Certainty* after 12 ſuch Tranſmiſſions, will be but as a *Half*; and it will grow by that Time an Equal Lay, whether the *Report* be *True* or No. In the ſame manner, if the *Proportion* of *Certainty* be ſet at $\frac{100}{101}$, it will come to a Half from the 70*th.* Hand, And if at $\frac{1000}{1001}$ from the 695*th.*

Prop. II. *Concerning* Concurrent *Teſtifications.*

If *Two Concurrent Reporters* have, each of them, as $\frac{5}{6}$ of *Certainty*, they will both give me Aſſurance of $\frac{35}{36}$. or of 35 to *One*; if *Three*, an Aſſurance of $\frac{215}{216}$, or of 215. to *One.*

For if *one* of them gives a *Certainty* for 1200 *l.* as of $\frac{5}{6}$. there remains but an Aſſurance of $\frac{1}{6}$. or of 200 *l.* wanting to me, for the Whole. And towards that the 2*d. Atteſter* contributes, according to his Proportion of *Credibility*; That is, to $\frac{5}{6}$. of *Certainty* before had, he adds $\frac{5}{6}$ of the $\frac{1}{6}$. which was Wanting. So that there is now Wanting but $\frac{1}{6}$. of $\frac{1}{6}$; that is $\frac{1}{36}$; and conſequently I have, from them both, $\frac{35}{36}$. of *Certainty.* So from *Three*, $\frac{215}{216}$. *&c.*

That is, if the *Firſt Witneſs* gives me $\frac{a}{a+c}$ of *Certainty*, and there is wanting of it $\frac{c}{a+c}$; the *Second Atteſter* will add $\frac{a}{a+c}$ of that $\frac{c}{a+c}$.

And conſequently leave nothing but $\frac{c}{a+c}$ of that $\frac{a}{a+c} = \frac{c^2}{a+c^2}$.

And in like manner the 3*d. Atteſter* adds his $\frac{a}{a+c}$ of that $\frac{c^2}{a+c^2}$, and leaves Wanting only $\frac{c^3}{a+c^3}$, *&c.*

Corollary. Hence it follows, that if a *Single Witneſs* ſhould be only ſo far *Credible*, as to give me the *Half* of a *Full Certainty*; a *Second* of the ſame *Credibility*, would (joyned with the *Firſt*) give me $\frac{3}{4}$. a *Third* $\frac{7}{8}$. *&c.* So that the *Coatteſtation* of a *Tenth*, would give me $\frac{1023}{1024}$. of *Certainty*; and the *Coatteſtation* of a *Twentieth*, $\frac{2096999}{2097000}$ or above *Two Millions* to *one. &c.*

Prop. III. *Concerning the Credit of a* Reporter *for a Particular* Article *of that Narrative, for the* Whole *of which he is* Credible *in a certain Degree.*

Let

Let there be *Six* Particulars of a *Narrative* Equally Remarkable. If he to whom the *Report* is given, has $\frac{5}{6}$ of *Certainty* for the Whole or *Sum* of them, he has 35. to *one*, againſt the *Failure* in any *One* certain *Particular*.

For he has 5. to *one*, there will be no *Failure* at all: And if there be, he has yet another 5. to *One*, that it falls not upon that Single Particular of the *Six*: That is, he has $\frac{5}{6}$ of *Certainty* for the Whole, and of the $\frac{1}{6}$ Wanting he has likewiſe $\frac{5}{6}$, or $\frac{5}{36}$ of the Whole, more; and therefore that there will be no *Failure* in that *Single Particular*, he has $\frac{5}{6}$ and $\frac{5}{36}$ of *Certainty*; or $\frac{35}{36}$ of it.

In General, if $\frac{a}{a+c}$ be the *Proportion* of *Certainty* for the Whole, and $\frac{m}{m+n}$ be the *Chance* of the Reſt of the *Particular* Articles *m*, againſt ſome *One*, or *more* of them *n* there will be nothing Wanting to an *Abſolute Certitude*, againſt the not failing in the Article or Articles *n*, but only $\frac{nc}{\overline{m+n} \times \overline{a+c}}$.

Prop. IV. *Concerning the* Truth *of either* Oral *or* Written Tradition, (*in Whole, or in Part,*) Succeſſively *Tranſmitted, and alſo* Coatteſted *by ſeveral* Succeſſions *of* Tranſmittents.

1. Suppoſing the *Tranſmiſſion* of an *Oral Narrative* to be ſo performed by a *Succeſſion* of *Single* Men, or Joyned in *Companies*, as that each *Tranſmiſſion*, after the *Narrative* has been kept for 20 *Years*, Impairs the *Credit* of it a 12*th.* part; and that conſequently in the 12*th. Hand*, or at the end of 240. *Years*, its *Certainty* is Reduced to a *Half*; and there grows then an Even Lay (by the *Corollary* of the 2*d. Propoſition*) againſt the *Truth* of the *Relation*: Yet if we further ſuppoſe, that the ſame *Relation* is *Coatteſted* by 9 other Several *Succeſſions*, *Tranſmitting* alike each of them, the *Credibility* of it when they are all found to Agree, will (by the *Corollary* of the *Firſt Propoſition*) be as $\frac{1023}{1024}$ of *Certainty*, or above a *Thouſand* to *one*; and if we ſuppoſe a *Coatteſtation* of 19, the *Credibility* of it will be as above 2 *Millions* to *One*.

2. In *Oral Tradition*, as a *Single* Man is Subject to much Caſuality, ſo a *Company* of Men cannot be ſo eaſily ſuppoſed to Joyn; and therefore the *Credibility* of $\frac{100}{106}$ or about $\frac{19}{20}$ may poſſibly be Judg'd too High a Degree for an *Oral Conveyance*, to the diſtance of 20 *Years*. But in *Written Tradition*, the *Chances* againſt the *Truth* or *Conſervation* of a *Single Writing* are far Leſs: and ſeveral *Copies* may alſo be Eaſily ſuppoſed to Concurr, and thoſe ſince the Invention of *Printing* exactly the ſame; Several alſo *Diſtinct Succeſſions* of ſuch *Copies* may be as well Suppoſed, taken by *Different* Hands, and Preſerv'd in Different Places or *Languages*.

And

And therefore if *Oral Tradition* by any *One* Man or *Company* of Men might be Suppoſed to be *Credible* after 20 *Years*, at $\frac{12}{20}$ of *Certainty*, or but $\frac{2}{10}$, or $\frac{1}{6}$, a *Written Tradition* may be well imagined to Continue, by the *Joynt Copies* that may be taken of it for *One* place, (like the ſeveral *Copies* of the ſame *Impreſſion*) during the ſpace of 100, if not 200 *Years*; and to be then *Credible* at $\frac{100}{101}$ of *Certainty*, or at the *Proportion* of 100 to 1. And then ſeeing that the *Succeſſive Tranſmiſſions* of this $\frac{100}{101}$ of *Certainty*, will not *Diminiſh* it to a *Half* until it paſſes the 69*th*. *Hand*, (for it will be near 70 *Years* before the *Rebate* of *Money*, at that *Intereſt*, will ſink it to *Half*,) It is plain, that *Written Tradition*, if preſerved but by a *Single Succeſſion* of *Copies*, will not Looſe *Half* of its Full *Certainty*, until 70 times 100, if not 200 *Years* are paſt; that is 7000, if not 14000 *Years*. And further, that, if it be likewiſe Preſerved by *Concurrent Succeſſions* of ſuch *Copies*, its *Credibility* at that Diſtance may be even *Increaſed*, and grow far more *Certain* from the ſeveral Agreeing Deliveries at the End of 70 *Succeſſions*, than it would be at the very *Firſt* from either of the *Single Hands*.

3. *Laſtly*, in Stating the *Proportions* of *Credibility* for any *Part* or Parts of a *Copy*, it may be Obſerved, that in an *Original*, not very Long, good Odds may be Laid, that a *Copy* by a carefull Hand ſhall not have ſo much as a *Literal Fault*: But in One of Greater Length, that there may be Greater Odds againſt any *Material Error*, and ſuch as ſhall Alter the *Senſe*; Greater yet, that the *Senſe* ſhall not be Altered in any *Conſiderable Point*; and ſtill Greater, if there be many of theſe *Points*, that the *Error* lights not upon ſuch a *Single Article*; as in the *Third Propoſition*.

XXVI. At *London* in the *Year* 1685. there were

General Bills of Mortality *in* London; n. 177. p. 1245.

	Chriſtened;	*Males*,	7484.	*Females*,	7246.	in all,	14730.
	Buryed;	*Males*,	11891.	*Females*,	11331.	in all,	23222.
An. 1686.	*Chriſten'd*;	*Males*,	7575.	*Females*,	7119.	in all,	14694.
	Bury'd;	*Males*,	11828.	*Females*,	10781.	in all,	22609.
An. 1687.	*Chriſten'd*;	*Males*,	7737.	*Females*,	7214.	in all,	14951.
	Bury'd;	*Males*,	11174.	*Females*,	10286.	in all,	21460.

n. 191. p. 445.

XXVII. *The Number of the* Houſes *and* Hearths *in* Dublin; *by Capt.* South. n. 261. p. 518.

		Good	*Poor*	*Waſt*	*Total*
Jan. $169\frac{5}{6}$.	*Houſes*——	4665	485	849	5999
$169\frac{6}{7}$		4905	502	717	6124
Jan. $169\frac{5}{6}$	*Hearths*——	24402	1080	3439	29220
$169\frac{6}{7}$		25366	1227	2627	29519

In the *Total* of *Hearths*, there are Included 299 which are in *Colledges*, *&c.* and are not reckoned in the 3 *Firſt Columns*.

XXVIII. *The Number of* People *in* Ireland, *An.* 1695 *by Capt.* South. n. 261. p. 520.

County of *Ardmagh*	Persons *Assessed*	25185	
	Persons *Exempted*	455	25640
County of *Lowth*	Persons *Assessed*	16502	
	Persons *Exempted*	701	17203
County of *Meath*	Persons *Assessed*	42181	
	Persons *Exempted*	1138	43319
Total of these *three Counties*			86162
City of *Dublin*			40508
In the rest of the Kingdom, according to the *first Quarter's Assessment* of the *Poll*, there are, in Proportion to the above 3 *Counties*, which were very Exactly Returned			907432
		Total	1034102

XXIX. *A List of the* Seafaring People *in* Ireland, An. 1697. *by Capt.* South. n. 261. p. 519.

	Seamen	*Fishermen*	*Boatmen*	*Total*	*Whereof Papists*
Baltimore and Members	9	188	84	281	268
Belfast, &c. Carrickfergus Included	194	62	12	268	2
Coleraine	48	233	169	450	209
Cork	58	34	91	183	111
Donoghade, whereof *Masters* 35.	283	28	2	313	
Drogheda	22	56		78	61
Dublin	42	271	99	412	276
Dundalk and *Carlingford*	2	90		92	51
Galloway	42	42	88	172	140
Killebeggs	5	120	4	129	78
Kinsale	104	76	45	225	106
Limerick	13		137	150	132
Londonderry	56	46	22	124	36
Rosse	20	85	77	182	148
Sligo	11	68	8	87	60
Strangford	69	159	12	240	78
Tralee and *Kerry*	2	165		167	163
Waterford	36	83	50	169	143
Wexford	80	346		426	399
Wicklow	22	49	5	76	58
Youghall	40	114	46	200	135
Total	1158	2315	951	4424	2654

XXX.

XXX.
The Number of the Romish Clergy *in* Ireland, *An.* 1698; *by Capt.* South. n. 261. p. 521.

Counties.	*Regulars*	*Seculars*	*Counties.*	*Regulars*	*Seculars*
Cavan	5	29	*Kildare*	9	16
Fermanagh	6	13	*Lowth*	12	14
Donegal	22	24	*Carlow*	8	8
Tyrone	7	22	*Kilkenny*	17	30
Downe	4	15	*King's County*	13	19
Antrim	5	13	*Queen's County*	1	16
Ardmagh	4	10	*West-Meath*	16	22
Monoghan	5	20	*Longford*	15	22
Waterford	16	23	*Roscommon*	24	52
Limerick	15	51	*Leitrim*	13	20
Clare	18	43	*Sligoe*	31	31
Cork	30	97	*Mayoe*	42	50
Kerry	19	23	*Gallway*	39	45
Tipperary	48	39	*Meath*	19	23
Londonderry	5	15	*Dublin*	1	26
Wicklow	6	15	*Drogheda* Town	4	2
Wexford	16	24			
			Total	495	872

Shipt for *Forreign* Parts, by *Act of Parliament*, the Number of *Regulars* following, their Passage and Provisions being paid for by the Government: *(viz.)*

From *Dublin*	153
Gallway	170
Cork	75
Waterford	26
Total	424

XXXI.
Bills of Marriages, Births, *and* Burials, *in* Franckfort *on the* Maine; *by Dr.* Fred. Slare. n. 229. p. 589.

A. 1695.	*Marry'd*	*Christen'd*	*Bury'd*		*Marry'd*	*Christen'd*	*Bury'd*
January.	23	79	72	*July.*	21	69	56
February.	17	67	76	*August.*	28	78	63
March.	00	65	62	*September.*	15	73	63
April.	35	78	58	*October.*	31	86	45
May.	25	89	77	*November.*	25	69	45
June.	20	75	74	*December.*	08	88	57
				Sum.	248	916	748

So that there were *Married* 248 *Couples*; and amongst them 2 *Couples* that Lived before, 50 *Years* in *Matrimony.*

Christen'd in
- *Franckfort*; *Citizens Children*, 534. *Forreigners*, 234. *Males*, 420. *Females*, 348. in all, 768. And amongst them *Twins* 11. *Posthumous* 11. *Jews* 2. *Bastards* 13.
- *Sachsenhousen*; *Citizens Children*, 94. *Forreigners*, 54. *Males*, 84. *Females*, 64. in all, 148. And amongst them *Twins*, 4. *Posthumous*, 1. *Bastards*, 2.

Christen'd in all, 916.

Deceas'd in
- *Franckfort*; *Citizens*, 63. *Women*, 39. *Widows*, 24. *Sons* 153. *Daughters*, 123. *Not Christen'd*, 7. *Forreigners*, 194. Out of the *Hospital*, 30. Out of the *Alms*, *Orphans*, and *Work-Houses*, 9. in all, 642.
- *Sachsenhousen*; *Citizens*, 8. *Women*, 3. *Widows*, 3. *Sons*, 20. *Daughters*, 14. *Not Christen'd*, 3. *Forreigners*, 55. in all, 106.

Deceased in all, 748.

XXXII. Marriages Births *and* Burials, *in* Old, Middle, *and* Lower Marck. n. 260. p. 471.

In the *Year* 1698	*Married.*	*Christened.*	*Bastards*	*Bury'd*
In *Thurfurſtl, Schlobanc Dohm-Kirchen.*	63	117		69
In *Berlin*	88	332	9	200
In *Berliniſchen* Inſpect.	185	717	26	469
In *Berlin* Suburbs	36	143	14	136
In *Collen*	62	188	4	98
In *Colleniſchen* Inſpect.	58	263	4	88
In *Colleniſchen* Suburbs	11	87	8	17
In *Frederechsweſder*	22	103	4	51
In *Dorotheen-Stadt*	26	100		36
In *Frederich-Stadt*	38	146	12	37
Of the *Guarniſon*				
Die *Frankoſiſ. Gemeinde in heiſigen Thurf. Reſidenk Stadten*	57	259		138
Alleſtadt Brandenb. Inſ.				
Reuſtadt Brandenb. Inſpection	99	388		166
Stifft Brandenb. Inſp.	56	235		129
Franckfurtiſche Inſpect.	243	872		438
Reformirte Gemeinde zu *Frankfurt* an der *Oder*				
Perlebergiſche Inſpect.	92	375		226
Reuen Ruppiniſche Inſ.	82	330		171
Wittſtockiſche Inſpect.	46	211		111
Havelbergiſche Inſpect.	30	154		86
Im *Dohm* zu *Havelberg*	16	93		55
Prikwalckiſche Inſpect.	82	314		163
Spandowiſche Inſpect.	94	364		170
Reform. Gemeinde zu *Spandow*	4	12		3
Ropenick und Zugehorige *Dorffer*				
Die *Frankoſiſche* Gemeinde zu *Spandow*				
Duranienburg	12	30		22
Reformirte Gemeinde zu *Duranienburg*				
Bernaviſche Inſpect.	62	231	2	100
Granſeeiſche Inſpect.	15	62		29
Reformirte Gemeinde zu *Granſee*				
Prenklowiſche Inſpect.	257	802	23	361
Joſſenſche Inſpect.	41	161		80
Joachimſthal und *Zugehorige Dorffer.*	9	49	5	13

In the *Year* 1698	*Married*	*Christen'd.*	*Bastards*	*Bury'd*
Straukbergiſche Inſp.	22	93		44
Zehdeniſche Inſp.	40	148		88
Ravenſche Inſpect.	142	303		67
Reu-Angermundiſche Inſpect.	102	362	9	154
Lenkenſche Inſpect.	51	220		127
Rathenowiſche Inſp.	92	381		180
Wriekenſche Inſpect.	52	193		110
Treven Briekenſche Inſpect.	34	127		52
Beelikſche Inſpect.	28	93		57
Beeklowiſche Inſp.	50	206		87
Mittenwaldiſche Inſ.	23	84		48
Lindowiſche Inſpect.	16	96	1	42
Furſtenwaldiſche Inſ.	26	95	4	42
Reuſtadt Eberkwaldiſche Inſpect.	22	118	6	51
Munchebergiſche Inſ.	64	236		121
Stendaliſche Inſpect.	95	226		186
Altwadt Galkewedelſche Inſpect.	142	521	25	320
Reuſtadt Galkwedel	11	56	4	43
Putliſche Inſpect.	49	188		94
Gardelegenſche Inſp.	94	393	2	232
Gechauſenſche Inſp.	109	321		260
Ayrikſche Inſpect.	39	144		82
Apenburgiſche Inſp.				
Tangermundiſche In.	71	330		132
Ziegeſarſche Inſp.	44	146		85
Werbenſche Inſpect.	43	157		90
Wilknackſche Inſp.	19	80		42
Wuſterhauſenſche In.	71	251		127
Calbiſche Inſpect.	67	201		120
Templiniſche Inſp.	27	117		63
Gramzowiſche Inſp.	36	135	7	59
Oſterburgiſche Inſp.	32	147		78
Straakburgiſche Inſ.	25	138		69
Trebbin	7	44	2	18
Teltow	1	30		8
Liebenberg.	10	24		4
Storckowiſche Inſp.	37	178	1	66
Alten Landsberg und *zugehorige Dorffer.*	9	24		17
Reform. Gem. zu *Alten Landsburg*				
Buchholk	11	32	1	11

The *Sum* of the *Marry d*, 3698. *Chriſten'd*, 13776. whereof *Baſtards*, 173. *Deceaſed*, 7138.

XXXIII. Mar-

XXXIII. Marriages, Births *and* Burials, *in the Dominions of* the E. *of* Brandenburg.

In the *Year* 1698.	*Marry'd*	*Christen'd*	*Bury'd*
In der *Chur*-und *Mard-Brandenburg*	3702	13792	7149
In der *Neu-Ward* und *Lande Sternberg.*	1528	5746	3211
Im *Herkogthumb Preuſſen*	616	21803	17091
Im *Herkogthumb Magdeburg*	1357	5480	3042
Im *Herkogthumb Cleve* und *Graffſchafft Marck*	1888	6178	4215
Im *Herkogthumb Pommern*	1714	7244	4827
Im *Furſtenthumb Halberſtadt*	488	2297	1192
Im *Furſtenthumb Minden.*	525	1937	1326
In der *Graffſchafft Hohenſtein*	145	568	415
In der *Graffſchafft Ravensberg.*	665	2223	1789
In der *Herrſchafft Lauenburg* und *Butow*	125	495	421
The *Sum*	18298	67763	44678

n. 261. p. 508.

XXXIV. The City of *Breſlaw* is the Capital City of the Province of *Sileſia*; or, as the *Germans* call it, *Schleſia*: And is ſituated on the Eaſtern Bank of the River *Oder*, anciently called *Viadrus*, near the Confines of *Germany* and *Poland*, and very nigh the *Latitude* of *London*. It is very far from the Sea, and as much a *Mediterranean* Place as can be deſired; whence the Confluence of *Strangers* is but Small; and the Manufacture of *Linnen* employs chiefly the Poor People of the place, as well as of the Country round about, whence comes that ſort of *Linnen* we uſually call your *Scleſie Linnen*, which is the chief, if not the only Merchandize of the place. For theſe Reaſons the *Degrees* of *Mortality* in this City ſeem moſt Proper for a *Standard*; and the rather, for that the *Births* do a Small matter Exceed the *Funerals*. The only thing wanting is the *Number* of the *whole People*, which in ſome meaſure I have endeavoured to Supply by compariſon of the *Mortality* of the People of all *Ages*; which I ſhall Trace out with all the Accuracy poſſible, from the Curious Tables of the *Births* and *Funerals*, drawn up Monthly by Dr. *Newman* of that City.

The Value of Annuities *upon* Lives, *drawn from the* Bills *of* Mortality *at* Breſlaw; *by Mr.* Edm. Halley. n. 196. p. 596.

It thence appears, that in the *Five Years* from 87 to 91 *Incluſive*, there were *Born* 6193 Perſons, and *Buried* 5869; that is *Born per Annum* 1238, and *Buried* 1174. Whence an *Encreaſe* of the People may be argued of 64 *per Annum*, or of about a 20*th.* part; which may perhaps be ballanced by the *Levies* for the *Emperor's* Service in his Wars. But this being contingent and the *Births* Certain, I will ſuppoſe the People of *Breſlaw* to be Encreaſed, by 1238 *Births Annually*. Of theſe it appears by the ſame *Tables*, that 348 do *Dye Yearly* in the *Firſt Year* of their Age, and that but 890 do Arrive at a Full *Year's* Age; and likewiſe, that 193 do *Die* in the *Five Years* between 1 and 6 Compleat, taken

at

at a *Medium*; ſo that but 692 of the Perſons *Born* do Survive 6 whole *Years*. From this Age the Infants, being arrived at ſome degree of Firmneſs, grow Leſs and Leſs Mortal; and it appears that of the whole People of *Breſlaw* there Die *Yearly*, as in the following *Table*; wherein the *Upper Line* ſhews the *Age*, and the next under it the *Number* of Perſons of that Age *Dying Yearly*,

7.	8.	9.	..	14.	..	18.	..	21.	..	27.	28.	..	35.	36.	..	42.	..	45.	..
11.	11.	6.	$5\frac{1}{2}$.	2.	$3\frac{1}{2}$.	5.	6.	$4\frac{1}{2}$.	$6\frac{1}{2}$.	9 .	8.	7.	7.	8.	$9\frac{1}{2}$.	8.	9.	7.	7.

49.	54.	55.	56.	..	63.	..	70.	71.	72.	..	77.	..	81.	..	84.	..	90.
10.	11.	9.	9.	10.	12.	$9\frac{1}{2}$.	14.	9.	11.	$9\frac{1}{2}$.	6.	7.	3.	4.	2.	1.	1.

91.	98.	99.	100.
1.	0.	$\frac{1}{5}$.	$\frac{1}{5}$.

And where No *Figure* is placed over, it is to be underſtood of thoſe that Die between the *Ages* of the Preceding and Conſequent Column.

From this *Table* it is Evident, that from the Age of 9 to about 25, there does not *Die* above 6 *per Annum* of each Age, which is much about one *per Cent.* of thoſe that are of thoſe Ages: And whereas in the 14, 15, 16, 17, Years there appear to *Die* much Fewer, as 2 and $3\frac{1}{2}$ yet that ſeems rather to be Attributed to Chance; as are the other Irregularities in the Series of *Ages*, which would Rectify themſelves, were the Number of Years much more conſiderable, as 20 inſtead of 5. And by our own Experience in *Chriſt-Church Hoſpital*, I am informed there *Die* of the *Young Lads*, much about *One per Cent. per Annum*, they being of the aforeſaid *Ages*. From 25 to 50, there ſeem to Die from 7 to 8, and 9, *per Annum* of each *Age*; and after that to 70, they growing more Craſie, though the *Number* be much Diminiſhed, yet the *Mortality* Encreaſes, and there are found to Die 10 or 11 of Each *Age per Annum*. From thence the Number of the *Living* being very Small, they Gradually Decline till there be none Left to *Die*; as may be ſeen at one view in the *Table*.

From theſe Conſiderations I have formed the Adjoyned *Table*, whoſe Uſes are manifold, and give a more Juſt *Idea* of the *State* and *Condition* of *Mankind*, than any thing yet Extant that I know of. It exhibits the *Number* of People in the City of *Breſlaw* of all *Ages* from the *Birth* to Extreme *Old Age*, and thereby ſhews the *Chances* of Mortality at all *Ages*; and likewiſe how to make a Certain Eſtimate of the *Value* of *Annuities* for *Lives*, which hitherto has been only done by an Imaginary *Valuation*; Alſo the *Chances* that there are that a Perſon of any *Age* propoſed does *Live* to any other *Age* Given; with many more, as I ſhall hereafter ſhew. This *Table* does ſhew the *Number* of Perſons that are *Living* in the *Age Current* Annexed thereto, as follows.

Age

Age Cur.	Per- ſons.	Age Cur.	Per- ſons.	Age Cur.	Per- ſons.	Age Cur.	Per- ſons.	Age Cur.	Per- ſons.	Age Cur.	Per- ſons.
1	1000	8	680	15	628	22	586	29	539	36	481
2	855	9	670	16	622	23	579	30	531	37	472
3	798	10	661	17	616	24	573	31	523	38	463
4	760	11	653	18	610	25	567	32	515	39	454
5	732	12	646	19	604	26	560	33	507	40	445
6	710	13	640	20	598	27	553	34	499	41	436
7	692	14	634	21	592	28	546	35	490	42	427
Age Cur.	Per- ſons.	Age Cur.	Per- ſons.	Age Cur.	Per- ſons.	Age Cur.	Per- ſons.	Age Cur.	Per- ſons.	Age Cur.	Per- ſons.
43	417	50	346	57	272	64	202	71	131	78	58
44	407	51	335	58	262	65	192	72	120	79	49
45	397	52	324	59	252	66	182	73	109	80	41
46	387	53	313	60	242	67	172	74	98	81	34
47	377	54	302	61	232	68	162	75	88	82	28
48	367	55	292	62	222	69	152	76	78	83	23
49	357	56	282	63	212	70	142	77	68	84	20

Age.	Perſons.
7	5547
14	4584
21	4270
28	3964
35	3604
42	3178
49	2709
56	2194
63	1694
70	1204
77	692
84	253
100	107
Sum Total.	34000

Thus it Appears, that the *Whole People* of *Breſlaw* does conſiſt of 34000 *Souls*, being the *Sum Total* of the Perſons of All *Ages* in the *Table*.

The *Firſt Uſe* hereof is to ſhew the *Proportion* of Men able to *Bear Arms* in any Multitude, which are thoſe between 18 and 56, rather than 16 and 60; the One being generally too Weak to bear the Fatigues of *War*, and the Weight of *Arms*, and the other too Craſie and Infirm from *Age*, notwithſtanding particular Inſtances to the contrary. Under 18, from the *Table*, are found in this *City* 11997 Perſons, and 3950 above 56, which together make 15947. So that the Reſidue to 34000, being 18053, are Perſons between thoſe *Ages*. At leaſt One *Half* thereof are *Males*, or 9027: So that the whole *Force* this City can Raiſe of *Fencible Men*, as the *Scotch* call them, is about 9000, or $\frac{2}{3+}$, or ſomewhat more than a *Quarter*, of the *Number* of Souls; which may perhaps paſs for a *Rule* for all other places.

The *Second Uſe* of this *Table* is to ſhew the Differing *Degrees* of *Mortality*, or rather *Vitality*, in all *Ages*: for if the *Number* of *Perſons* of any *Age* remaining after *One Year*, be *Divided* by the Difference between that and the Number of the *Age* propoſed, it ſhews the *Odds* that there is, that a Perſon of that *Age* does not *Die* in a *Year*. As for inſtance, a Perſon 25 *Years* of *Age* has the odds of 560 to 7, or 80 to 1, that he does not *Dye* in a *Year*: Becauſe that of 567 *living* of 25 *Years* of *Age*, there do *Die* no more than 7 in a *Year*, leaving 560 of 26 *Years* Old.

So likewiſe for the *Odds*, that any Perſon does not *Die* before he Attain any Propoſed *Age*, Take the Number of the remaining Perſons of the *Age* Propoſed, and *Divide* it by the Difference between it and the Number of thoſe of the *Age* of the Party Propoſed; and that ſhews the *Odds* there

is

is between the *Chances* of the Parties *Living* or *Dying*. As for inſtance; What is the *Odds* that a Man of 40 *Lives* 7 *Years*? Take the *Number* of Perſons of 47 *Years*, which in the *Table* is 377, and *Subſtract* it from the *Number* of Perſons of 40 *Years*, which is 445, and the Difference is 68: Which ſhews that the Perſons *Dying* in that 7 *Years* are 68, and that it is 377 to 78, or $5\frac{1}{2}$ to 1, that a Man of 40 does *Live* 7 *Years*. And the like for any other *Number* of *Years*.

Uſe III. But if it be Required at what *Number* of *Years* it is an *Even Lay*, that a Perſon of any *Age* ſhall *Die*, this *Table* readily performs it: For if the *Number* of Perſons *Living* of the *Age* Propoſed be *Halfed*, it will be found by the *Table* at what *Year* the ſaid Number is Reduced to *Half* by *Mortality*; and that is the *Age*, to which it is an *Even Wager*, that a Perſon of the *Age* propoſed ſhall Arrive before he *Die*. As for Inſtance; a Perſon of 30 *years* of *Age* is propoſed, the *Number* of that *Age* is 531, the *Half* thereof is 275, which Number I find to be between 57 and 58 *years*; ſo that a Man of 30 may reaſonably Expect to *Live* between 27 and 28 *Years*.

Uſe IV. By what hath been ſaid, the *Price* of *Inſurance* upon *Lives* ought to be Regulated: and the Difference is diſcovered between the Price of *Enſuring* the *Life* of a Man of 20 and 50, for *Example*; it being 100 to 1, that a Man of 20 *Dies* not in a *Year*, and but 38 to 1, for a Man of 50 *Years* of *Age*.

Uſe V. On this Depends the *Valuation* of *Annuities* upon *Lives*: for it is plain, that the Purchaſer ought to Pay for only ſuch a part of the *Value* of the *Annuity*, as he has *Chances* that he is *Living*; and this ought to be Computed *Yearly*, and the *Sum* of all thoſe *Yearly Values*, being added together, will amount to the *Value* of the *Annuity* for the *Life* of the Perſon Propoſed.

Now the *Preſent Value* of Money payable after a *Term* of *Years*, at any given *Rate* of *Intereſt*, either may be had from *Tables* already Computed, or almoſt as Compendiouſly, by the *Table* of *Logarithms*: For the *Arithmetical Complement* of the *Logarithm* of *Unity* and its *yearly Intereſt* (that is, of 1,06. for *6 per Cent.* being 9,974694.) being *Multiplied* by the *Number* of *Years* propoſed, gives the *Preſent Value* of *One Pound* payable after the End of ſo many *years*. Then by the Foregoing *Propoſition*, it will be, as the *Number* of *Perſons Living* after that Term of *years*, to the *Number Dead*, ſo are the *Odds* that any *One* Perſon is *Alive* or *Dead*. And by Conſequence, as the *Sum* of both, or the Number of Perſons *Living* of the *Age* firſt propoſed, to the Number Remaining after ſo many *years*,(both given by the *Table*,) ſo the preſent *Value* of the *yearly Sum* Payable after the *Term* propoſed, to the *Sum* which ought to be payed for the *Chance* the Perſon has to enjoy ſuch an *Annuity* ſo Many *Years*. And this being repeated for Every *Year* of the Perſon's *Life*, the *Sum* of all the *Preſent Values* of thoſe *Chances* is the True *Value* of the *Annuity*. This will without doubt appear to be a moſt Laborious Calculation: But it being one of the

Principal

Principal *Uſes* of this Speculation, and having found ſome *Compendia* for the Work, I took the Pains to Compute the following *Table*; being the ſhort Reſult of a not Ordinary Number of *Arithmetical Operations*. It ſhews the *Value* of *Annuities* for every *Fifth Year* of *Age*, to the 70*th*. as follows.

Age	*Year's Purchaſe*	*Age*	*Year's Purchaſe*	*Age*	*Year's Purchaſe*
1	10,28	25	12,27	50	9,21
5	13,40	30	11,72	55	8,51
10	13,44	35	11,12	60	7,60
15	13,33	40	10,57	65	6,54
20	12,78	45	9,91	70	5,32

Uſe VI. *Two Lives* are likewiſe *Valuable* by the ſame Rule: For the Number of *Chances* of each *Single* Life, found in the *Table*, being *Multiplied* together, become the *Chances* of the *Two Lives*. And after any certain *Term* of *Years*, the *Product* of the Two Remaining *Sums* is the *Chances* that *Both* the Perſons are *Living*; the *Product* of the Two *Differences*, being the *Numbers* of the *Dead* of both *Ages*, are the *Chances* that *Both* the Perſons are *Dead*; and the Two *Products* of the Remaining *Sums* of the One *Age Multiplied* by thoſe *Dead* of the Other, ſhew the *Chances* that there are that Each Party *Survives* the Other; Whence is derived the *Rule* to Eſtimate the *Value* of the *Remainder* of One Life after another. Now as the *Product* of the Two Numbers in the *Table* for the Two *Ages* Propoſed, is to the Difference between that *Product* and the *Product* of the Two Numbers of Perſons *Deceaſed* in any ſpace of Time, ſo is the *Value* of a Sum of *Money* to be paid after ſo much Time, to the *Value* thereof under the Contingency of *Mortality*. And as the aforeſaid *Product* of the Two Numbers anſwering to the *Ages* propoſed, to the *Product* of the *Deceaſed* of One *Age Multiplied* by thoſe Remaining *Alive* of the Other, ſo the *Value* of a Sum of *Money* to be paid after any Time propoſed, to the *Value* of the *Chances* that the One Party has that he Survives the Other whoſe Number of *Deceaſed* you made uſe of in the 2*d*. *Term* of the *Proportion*. This perhaps may be better underſtood by putting N, for the Number of the *Younger Age*; and n, for that of the *Elder*; Y y, the *Deceaſed* of Both *Ages* reſpectively; and R r, for the *Remainders*; and $R + Y = N$, and $r + y = n$. Then ſhall N n, be the whole Number of *Chances*; $Nn - Yy$, the *Chances* that One of the 2 Perſons is *Living*; Y y, the *Chances* that they are both *Dead*; R y, the *Chances* that the *Elder* Perſon is *Dead* and the *Younger Living*; and r Y, the *Chances* that the *Elder* is *Living* and the *Younger Dead*. Thus 2 Perſons of 18 and 35 are Propoſed, and after 8 *Years* theſe *Chances* are required. The Numbers for 18 and 35 are 610 and 490, and there are 50 of the *Firſt Age Dead in* 8 *Years*, and 73 of the *Elder Age*. There are in all 610 × 490, or 298900 *Chances*; of theſe there are 50 × 73, or 3650,

that they are Both *Dead*. And as 298900, to 298900—3650, or 295250; So is the *Preſent Value* of a Sum of *Money* to be paid after 8 *Years*, to the *Preſent Value* of a Sum to be paid if either of the Two *Live*. And as 560 x 73, ſo are the *Chances* that the *Elder* is *Dead*, leaving the *Younger*; and as 417 x 50 ſo are the *Chances* that the *Younger* is *Dead*, leaving the *Elder*. Wherefore as 610 x 490, to 560 x 73, ſo is the *Preſent Value* of a Sum to be paid at 8 *Years* End, to the Sum to be paid for the *Chance* of the *Younger's Survivance*; and as 610 x 490, to 417 x 50, ſo is the ſame *Preſent Value*, to the Sum to be paid for the *Chance* of the *Elder's Survivance*.

Fig. 81. This poſſibly may be yet better Explained by Expounding theſe *Products* by *Rectangular Parallelograms*, as in *Fig.* 81. wherein *AB*, or *CD*, repreſents the *Number* of Perſons of the *Younger Age*; and *DE*, *BH*, thoſe Remaining *Alive* after a Certain *Term* of *Years*: whence *CE*, will anſwer the Number of thoſe *Dead* in that time: So *AC*, *BD*, may Repreſent the Number of the *Elder Age*; *AF*, *BI*, the *Survivors* after the ſame Term; and *CF*, *DI*, thoſe of that *Age* that are *Dead* at that Time. Then ſhall the Whole *Parallelogram ABCD*, be *Nn*, or the *Product* of the Two Numbers of Perſons, repreſenting ſuch a Number of Perſons of the 2 *Ages* given; and, by what was ſaid before, after the Term Propoſed the *Rectangle HD*, ſhall be as the Number of Perſons of the *Younger Age* that *Survive*, and the *Rectangle AE*, as the Number of thoſe that *Die*. So likewiſe the *Rectangles AI*, *FD*, ſhall be as the Numbers *Living*, and *Dead*, of the other *Age*. Hence the *Rectangle HI*, ſhall be as an Equal Number of both *Ages Surviving*; The *Rectangle FE*, being the *Product* of the *Deceaſed*, or *Yy*, an equal Number of Both *Dead*; The *Rectangle GD*, or *Ry*, a number *Living* of the *Younger Age*, and *Dead* of the *Elder*; And the *Rectangle AG*, or *rY*, a number *Living* of the *Elder Age*, but *Dead* of the *Younger*. This being underſtood, it is Obvious, that as the *Whole Rectangle AD*, or *Nn*, is to the *Gnemon FABDEG*, or *Nn—Yy*, ſo is the *Whole* Number of Perſons or *Chances*, to the Number of *Chances* that *One* of the 2 Perſons is *Living*. And as *AD*, or *Nn*, is to *FE*, or *Yy*, ſo are All the *Chances*, to the *Chances* that *Both* are *Dead*; whereby may be Computed the *Value* of the *Reverſion* after *Both Lives*. And as *AD*, to *GD*, or *Ry*, ſo the *Whole* Number of *Chances*, to the *Chances* that the *Younger* is *Living* and the *Other Dead*; whereby may be Caſt up what *Value* ought to be paid for the *Reverſion* of *One Life* after another, as in the Caſe of providing for *Clergymens Widows* and others by ſuch *Reverſions*. And as *AD*, to *AG*, or *rY*, ſo are All the *Chances*, to thoſe that the *Elder Survives* the *Younger*. I have been the more particular, and perhaps Tedious, in this matter, becauſe it is the Key to the Caſe of *Three Lives*, which of it ſelf would not have been ſo eaſy to Comprehend.

Uſe VII. If *Three Lives* are Propoſed, to find the *Value* of an *Annuity* during the continuance of any of thoſe *Three Lives*, the *Rule* is, As the *Product* of the *Continual Multiplication* of the 3 Numbers in the *Table*, anſwering to the *Ages* Propoſed, is to the *Difference* of that *Product* and of the *Product* of the 3 Numbers of the *Deceaſed* of thoſe *Ages* in any given Term of *Years*,

ſo

ſo is the *Preſent Value* of a Sum of *Money* to be paid Certainly after ſo many *Years*, to the *Preſent Value* of the ſame Sum to be paid provided *One* of thoſe 3 Perſons be *Living* at the Expiration of that *Term*. Which Proportion being *Yearly* Repeated, the *Sum* of all thoſe *Preſent Values* will be the *Value* of an *Annuity* granted for 3 ſuch *Lives*. But to explain this, together with all the Caſes of *Survivance* in 3 *Lives*, Let N, be the Number in the Table for the *Younger Age*; n, for the *Second*; and ν, for the *Elder Age*: let Υ, be thoſe *Dead* of the *Younger Age* in the Term propoſed; y, thoſe *Dead* of the *Second Age*; and υ, thoſe of the *Elder Age*: and let R, be the *Remainder* of the *Younger Age*; r, that of the *Middle Age*; and ϱ, the *Remainder* of the *Elder Age*. Then ſhall $R + \Upsilon$, be Equal to N; $r + y$, to n; and $\varrho + \upsilon$, to ν; and the *Continual Product* of the 3 Numbers $N\,n\,\nu$, ſhall be Equal to the *Continual Product* of $R + \Upsilon \times r + \Upsilon \times \varrho + \upsilon$, which being the *Whole* number of *Chances* for 3 *Lives* is Compounded of the *eight Products* following, (1) $R\,r\,\varrho$, which is the Number of *Chances* that All 3 of the Perſons are *Living*; (2) $r\,\varrho\,\Upsilon$, which is the Number of *Chances* that the 2 *Elder* Perſons are *Living*, and the *Younger Dead*; (3) $R\,\varrho\,y$, the number of *Chances* that the *Middle Age* is *Dead* and the *Younger* and *Elder Living*; (4) $R\,r\,\upsilon$, being the *Chances* that the 2 *Younger* are *Living* and the *Elder Dead*; (5) $\varrho\,\Upsilon\,y$, the *Chances* that the 2 *Younger* are *Dead* and *Elder Living*; (6) $r\,\Upsilon\,\upsilon$, the *Chances* that the *Younger* and *Elder* are *Dead* and the *Middle Age* Living; (7) $R\,y\,\upsilon$, which are the *Chances* that the *Younger* is *Living* and the 2 *Other Dead*; (8) $\Upsilon\,y$, which are the *Chances* that *All Three* are *Dead*; Which Latter *Subſtracted* from the *Whole* Number of *Chances* $N\,n\,\nu$, leaves $N\,n\,\nu - \Upsilon\,y\,\upsilon$, the *Sum* of all the other 7 *Products*, in all of which One or More of the 3 Perſons are *Surviving*.

To make this yet more Evident, I have Added *Fig.* 82. wherein theſe 8 ſeveral *Products* are at One view Exhibited. Let the *Rectangled Parallelepipedon*, $A\,B\,C\,D\,E\,F\,G\,H$, be Conſtituted of the ſides $A\,B$, $G\,H$, *&c.* Proportional to N, the Number of the *Younger Age*; $A\,C$, $B\,D$, *&c.* Proportional to n; and $A\,G$, $C\,E$, *&c.* Proportional to the Number of the *Elder*, or ν; And the *Whole Parallelepipedon* ſhall be as the *Product* $N\,n\,\nu$, or our *Whole* Number of *Chances*. Let $B\,P$, be as R; and $A\,P$, as Υ: let $C\,L$, be as r; and $L\,n$, as y; and $G\,N$, as ϱ; and $N\,A$, as υ: and let the *Plain* $P\,R\,e\,a$, bemade parallel to the *Plain* $A\,C\,G\,E$; the *Plain* $N\,V\,b\,\Upsilon$, parallel to $A\,B\,C\,D$; and the *Plain* $L\,X\,T\,Q$, parallel to the *Plain* $A\,B\,G\,H$: And our *Firſt Product* $R\,r\,\varrho$, ſhall be as the *Solid* $S\,T\,W\,I\,F\,Z\,e\,b$; The *Second*, or $r\,\varrho\,\Upsilon$, will be as the *Solid* $E\,\Upsilon\,Z\,e\,Q\,S\,M\,I$; The 3*d.* $R\,\varrho\,y$, as the *Solid* $R\,H\,O\,V\,W\,I\,S\,T$; And the 4*th.* $R\,r\,\upsilon$, as the *Solid* $Z\,a\,b\,D\,W\,X\,I\,K$; 5*thly.* $\varrho\,\Upsilon\,y$, as the *Solid* $G\,Q\,R\,S\,I\,M\,N\,O$; *Sixthly*, $r\,\Upsilon\,\upsilon$, as $I\,K\,L\,M\,G\,\Upsilon\,Z\,A$; *Seventhly*, $R\,y\,\upsilon$, as the *Solid* $I\,K\,P\,O\,B\,X\,V\,W$; And *Laſtly*, $A\,I\,K\,L\,M\,N\,O\,P$, will be as the *Product* of the 3 Numbers of Perſons *Dead*, or $\Upsilon\,y\,\upsilon$.

I ſhall not Apply this in all the *Caſes* thereof for Brevity's ſake: only to ſhew in one how all the reſt may be performed, let it be Demanded, What *is the* Value *of the* Reverſion *of the* Younger Life *after the* Two Elder *Propoſed*? The Proportion is, as the *Whole* Number of *Chances*, or $N\,n\,\nu$, to the

Fig. 82.

Product $R y v$, so is the Certain *Present Value* of the Sum payable after any *Term* Proposed, to the *Value* due to such *Chances* as the *Younger* Person has to *Bury Both* the *Elder*, by the *Term* Proposed; which he therfore is to pay for. Here it is to be noted, that the *First Term* of all these *Proportions* is the same throughout, *viz.* $N n v$. The *Second* Changing *Yearly* according to the *Decrease* of R. $r. s$. and *Encrease* of Y. $y : v$. And the 3*d.* are Successively the *Present Values* of Mony payable after *One*, *Two*, *Three*, *&c. Years*, according to the Rate of *Interest* Agreed on. These Numbers, which are in all Cases of *Annuities* of necessary use, I have put into the Following Table, they being the *Decimal Values* of *One Pound* payable after the Number of *Years* in the *Margent*, at the Rate of 6 *per Cent.*

Years	*Present Value of* 1. *l.*	*Years*	*Present Value of* 1. *l.*	*Years*	*Present Value of* 1. *l.*
1	0,9434	19	0,3305	37	0,1158
2	0,8900	20	0,3118	38	0,1092
3	0,8396	21	0,2941	39	0,1031
4	0,7921	22	0,2775	40	0,0972
5	0,7473	23	0,2618	45	0,0726
6	0,7050	24	0,2470	50	0,0543
7	0,6650	25	0,2330	55	0,0406
8	0,6274	26	0,2198	60	0,0303
9	0,5919	27	0,2074	65	0,0227
10	0,5584	28	0,1956	70	0,0169
11	0,5268	29	0,1845	75	0,0126
12	0,4970	30	0,1741	80	0,0094
13	0,4688	31	0,1643	85	0,0071
14	0,4423	32	0,1550	90	0,0053
15	0,4173	33	0,1462	95	0,0039
16	0,3936	34	0,1379	100	0,0029
17	0,3714	35	0,1301		
18	0,3503	36	0,1227		

It were needless to advertise, that the great trouble of working so many Proportions will be very much Alleviated by using *Logarithms*; and that instead of using $N n v - Y y v$, for the 2*d. Term* of the Proportion in finding the *Value* of 3 *Lives*, it may suffice to use only $Y y v$, and then *Deducting* the 4*th. Term* so found out of the 3*d.* the *Remainder* shall be the *Present Value* sought: or all these 4 *Terms* being *Added* together, and *Deducted* out of the *Value* of the *Certain Annuity* for so many Years, will Leave the *Value* of the *Contingent Annuity* upon the *Chance* of *Mortality* of all those 3 *Lives*. For Example; Let there be 3 *Lives* of 10, 30, and 40 *Years* of *Age* Proposed, and the Proportions will be thus.

As

As 661 *in* 531 *in* 445, or 156190995, *or* Nnv;

to 8	*in* 8	*in* 9, *or*	576, *or* Yyv,	for the *First Year.*	*So* 0,9434, *to* 0,00000348
to 15	*in* 16	*in* 18, *or*	4320,	for the *Second Year.*	*So* 0,8900, *to* 0,00002462
to 21	*in* 24	*in* 28, *or*	14112,	for the *Third Year.*	*So* 0,8396, *to* 0,00008128
to 27	*in* 32	*in* 38,		for the 4*th. Year.*	*So* 0,7921, *to* 0,00016650
to 33	*in* 41	*in* 48,		for the 5*th. Year.*	*So* 0,7473, *to* 0,00031071
to 39	*in* 50	*in* 58,		for the 6*th. Year.*	*So* 0,7050, *to* 0,00051051

and so forth to the 60*th Year*, when we suppose the *Elder Life*, of 40, *Certainly* to be *Expired*; from whence till 70, we must Compute for the *First* and *Second* only; and from thence to 90, for the Single *Youngest Life*. Then the *Sum Total* of all these 4 *Proportionals* being taken out of the *Value* of a *Certain Annuity* for 90 *Years*, being 16,58 *Years Purchase*, shall Leave the Just *Value* to be paid for an *Annuity* during the *Whole Term* of the *Lives* of 3 Persons of the *Ages* Proposed. And *Note*, that it will not be Necessary to Compute for every *Year Singly*, but that in Most Cases every 4*th* or 5*th Year* may suffice, *Interpoling* for the intermediate years *Secundum Artem.*

It may be Objected, that the Different *Salubrity* of Places does hinder this Proposal from being *Universal*; nor can it be *Denied*: But by the Number that *Die*, being 1174 *per Annum* in 34000, it does appear that about a 30*th.* part *Die yearly*, as Sir *Will. Petty* has Computed for *London*; and the Number that *Die* in *Infancy*, is a Good Argument, that the *Air* is but Indifferently *Salubrious*. So that by what I can Learn, there cannot perhaps be One Better place proposed for a *Standard.*

I have sought if it were possible to find a *Theorem* that might be more Concise than the *Rules* before laid down: But in vain; for all that can be done to Expedite it, is by *Tables* of *Logarithms* ready Computed, to Exhibit the *Rationes* of N, to Y, in each *Single Life*, for every 3*d.* 4*th.* or 5*th. Year* of *Age*, as Occasion shall require; and these *Logarithms* being Added to the *Logarithms* of the *Present Value* of Money payable after so many *Years*, will give a *Series* of Numbers, the *Sum* of which will shew the *Value* of the *Annuity* sought. However for Each Number of this *Series*, *Two Logarithms* for a *Single Life*, 3 for 2 *Lives*, and 4 for 3 *Lives*, must necessarily be Added together. n. 198. p. 654.

It may not perhaps be Unacceptable to observe farther from these *Tables*, how Unjustly we Repine at the Shortness of our *Lives*, and think our selves Wronged if we attain not *Old Age*; whereas it appears hereby, that the One Half of those that are *Born* are *Dead* in 17 *Years* Time, 1238 being in that Time Reduced to 616. So that instead of Murmuring at what we call an *Untimely Death*, we ought to account it as a Blessing that we have Survived, perhaps by Many Years, that *Period* of *Life*, whereat the one *Half* of the Whole Race of *Mankind* does not Arrive.

I ſhall alſo obſerve, that the *Growth* and *Encreaſe* of *Mankind* is not ſo much *Stinted* by any thing in the nature of the *Species*, as it is from the Cautious Difficulty moſt People make to adventure on the State of *Marriage*, from the Proſpect of the Trouble and Charge of providing for a *Family*. For by Computation from the *Table*, I find that there are nearly 15000 Perſons above 16 and under 45, of which at leaſt 7000 are *Women* Capable to *Bear Children*: Of theſe notwithſtanding there are but 1238 *Born* yearly, which is but little more than a 6*th* part. So that about One in 6, of theſe *Women*, do *Breed yearly*: whereas were they *All Married*, it would not Appear Strange or Unlikely, that 4 of 6, ſhould bring a *Child* Every *Year*. The *Political* Conſequences hereof I ſhall not inſiſt on; only the *Strength* and *Glory* of a *King*, being in the *Multitude* of his *Subjects*, I ſhall Hint, that above all things *Celibacy* ought to be *Diſcouraged*; as by Extraordinary *Taxing* and *Military Service*: And thoſe who have *Numerous Families* of *Children* to be Countenanced and *Encouraged*, by ſuch Laws as the *Jus Trium Liberorum* among the *Romans*; But eſpecially by an effectual Care to provide for the Subſiſtence of the *Poor*, by finding them *Employments*, whereby they may Earn their Bread, without being Chargeable to the Publick.

Problems touching Compound Intereſt *and* Annuities; *Reſolved by Mr.* Adam Martindale; *with Explications, by Mr.* J. Collins. *Ph. Col.* n. 1. p. 34.

XXXV. *Twelve Problems* touching *Intereſt Compound*, and *Annuities*, Expreſſed in *Symbols*, to be Reſolved by *Logarithms*, and Diſtinguiſhed into three Ranks whoſe *Symbols* are thus to be underſtood.

p	Signifies	*Principal*	Common to all the 3 *Ranks*.
r		*Rate, viz.* 1. *lib.* with its *Rate*	
t		*Time*	
a		*Amount* or *Aggregate*	proper to 1. *Rank*.
s		*Sum* of *Principal* and *Arrearages*	proper to 2. *Rank*.
d		*Difference* of *Principal* and *Worth*	proper to 3. *Rank*.

Their *Capitals* ſtand for the *Logarithmes* of the Number Signified by the *Small Letters*. *D*, ſignifies *Data*; *Q*, *Quæſitum*; *Prob. Problem*; *Reſ. Reſolution*.

The *Firſt Rank*, touching *Compound Intereſt* for a *Single Sum* of Money.

1. *Prob.* D. *p*, *r*, *t*. Q. *a*? *Reſ.* $Rt + P = A$.
2. *Prob.* D. *a*, *r*, *t*. Q. *p*? *Reſ.* $A - Rt = P$.
3. *Prob.* D. *p*, *a*, *t*. Q. *r*? *Reſ.* $\frac{A - P}{t} = R$.
4. *Prob.* D. *p*, *r*, *t*. Q. *t*? *Reſ.* $\frac{A - P}{R} = t$.

The *Second Rank* concerning *Annuities* in *Arrear* at *Compound Intereſt*, grounded upon theſe two *Axioms*.

1. *The* Annuity *and* Rate *of* Intereſt *being Given, the* Principal *Correſpondent to the* Annuity *is in Effect given alſo; being eaſily found out by the* Rule of Three; *thus*,

As

As the Intereſt *of any* Principal, *(ex. gr.* of 1. 10. 100. *&c.) is to that* Principal: *So the* Annuity *or* Penſion, *to it's* Principal.

2. *The* Sum *of the* Principal *and the* Arrearage *of All the Payments being found, the* Arrearages *alone may be obtained by* Subſtracting *the* Principal *from that* Sum.

The Problems *are theſe that follow.*

1. *Prob.* D. p, r, t. Q. s? *Reſ.* $Rt + P = S$.
2. *Prob.* D. s, r, t. Q. p? *Reſ.* $S - Rt = P$.
3. *Prob.* D. p, s, t. Q. r? *Reſ.* $\frac{S - P}{t} = R$.
4. *Prob.* D. p, s, r. Q. t? *Reſ.* $\frac{S - P}{R} = t$.

The *Third Rank*, touching *Annuities Anticipated*, or bought for a *Sum in hand* (or Equivalent thereto) at *Compound Intereſt Diſcounted*, bottomed upon the Former of the *Two Axioms* above mentioned, and This that Followeth;

If the Difference *and* Worth *be once found, the* Worth *is eaſily obtained, by* Subſtracting *that* Difference *out of the* Principal, *which is ever greater, being the* Worth *of the* Annuity *at that* Rate *for ever.*

1. *Prob.* D. p, r, t. Q. d? *Reſ.* $P - Rt = D$.
2. *Prob.* D. d, r, t. Q. p? *Reſ.* $D + Rt = P$.
3. *Prob.* D. p, d, t. Q. r? *Reſ.* $\frac{P - D}{t} = R$.
4. *Prob.* D. p, d, r. Q. t? *Reſ.* $\frac{P - D}{R} = t$.

XXXVI. There are 2 *Lotteries*, at either of which a *Gameſter* paying a *Shilling* for a *Lot*, or Throw, the *Firſt Lottery* upon a Juſt Computation of the *Odds* has 3 to *One* of the *Gameſter*, the 2*d. Lottery* but 2 to 1: nevertheleſs the *Gameſter* has the very ſame Diſadvantage (and no more) in Playing at the *Firſt Lottery* as the *Second*.

An Arithmetical Paradox *concerning the* Chances *of* Lotteries; *by Mr.* Fr. Roberts. n. 198. p. 677.

It looks very like a Contradiction, that the Diſadvantage ſhould be no greater in Playing againſt 3 to 1, than 2 to 1, but it may thus be Reſolved.

Let the { 1*ſt.* / 2*d.* } *Lottery* conſiſt of { 3 / 4 } *Blanks* and { 3 / 2 } *Prizes* of { 16 *pence* / 2 *ſhill.* } a piece.

In the *Firſt Lottery* the *Gameſter* Hazards a *Shilling* to Win a *Groat*, and the *Chances* being Equal, it is Evident there is 3 to 1, againſt him.

In the 2*d. Lottery* the *Gameſter* Ventures a *Shilling* againſt a *Shilling*, and the *Lots* being 4 to 2. his Diſadvantage is *Two* to *One*.

And yet a *Lot* at either of them being truly Juſt Worth 8 *Pence*, (*viz.* the *6th* part of 3 times 16 *Pence*, or Twice 2 *Shillings*) the Diſadvantage muſt be the very ſame in both Caſes; that is the *Gameſter* pays a *Shilling* for a *Lot* that is Worth but 8 *Pence*.

The

The Method of Finding this Answer being somewhat out of the Common Road, I shall here Add it; and thereby Infinite Solutions of the same kind may be Discovered.

	1st. Lottery.	2d. Lottery.
Let	a = the Number of *Blanks*.	m = the Number of *Blanks*.
	b = the Number of *Prizes*.	n = the Number of *Prizes*.
	r = the Value of a *Prize*.	s = the Value of a *Prize*.

1 = to what you pay for a *Lot*; *viz.* a *Shilling*.

So the *Lottery* has its *Chances* for 1, and the *Gamester* his for $r-1$. Now the True *Odds* consisting of the Compounded Proportion of the *Chances* and the *Values*; *viz.* $\frac{a}{b}$ and $\frac{1}{r-1}$, the Share of the Lottery will be a, and that of the Gamester $rb-b$. Therefore as the present case stands, the *First Lottery* must be, $a=3rb-3b$; and by the like Reasoning the *Second Lottery* will be $m=2sn-2n$. Now the Value of a *Lot* being the Sum of the *Prizes* Divided by the Number of *Lots*, (which must be Equal in both *Lotteries*) it yields $\frac{rb}{a+b}=\frac{sn}{m+n}$. So to proceed.

a	1	$a=3rb-3b$
b	2	$m=2sn-2n$
r	3	$\frac{rb}{a+b}=\frac{sn}{m+n}$
m >= ?	4	(*)
n	5	(*)
s	6	(*)
q	7	Let $\frac{rb}{a+b}=q$
7 x $a+b$	8	$rb=qa+qb$
8 x 3	9	$3rb=3qa+3qb$
1 + $3b$	10	$3rb=a+3b$
9, 10	11	$3qa+3qb=a+3b$
Scope	12	If $a=0$, to avoid *Negative* Numbers
11, 12	13	$3b=3qb$
13 ÷ $3b$	14	$q=1$
12, 14	15	$q>1$, makes $a<0$; $q<1$, makes $a>0$
Scope	16	If $b=0$
11, 16	17	$3qa=a$
17 ÷ $3a$	18	$q=\frac{1}{3}$
16, 18	19	$q<\frac{1}{3}$, makes $b<0$; $q>\frac{1}{3}$, makes $b>0$

3, 7	20	$\frac{sn}{m+n} = q$
20 × $m+n$	21	$sn = qm + qn$
21 × 2	22	$2sn = 2qm + 2qn$
$2+2n$	23	$2sn = m + 2n$
22, 23	24	$2qm + 2qn = m + 2n$
Scope	25	If $m = 0$
24, 25	26	$2qn = 2n$
26 ÷ $2n$	27	$q = 1$
25, 27	28	$q > 1$ makes $m < 0$; $q < 1$ makes $m < 0$
Scope	29	If $n = 0$
24, 29	30	$2qm = m$
30 ÷ $2m$	31	$q = \frac{1}{2}$
29, 31	32	$q < \frac{1}{2}$ makes $n < 0$; $q > \frac{1}{2}$ makes $n > 0$
15,19,28,32	33	that $abmn$ may be > 0, q must be $> \frac{1}{2} < 1$.
33, 4 (*)	34	Let therefore $q = \frac{2}{3}$
7, 34	35	$\frac{rb}{a+b} = \frac{2}{3}$
35 x, 10	36	$3rb = 2a + 2b = a + 3b$
36—	37	$a = b$
20, 34	38	$\frac{sn}{m+n} = \frac{2}{3}$
38 x	39	$3sn = 2m + 2n$
39 x 2	40	$6sn = 4m + 4n$
23 x 3	41	$6sn = 3m + 6n$
40, 41	42	$4m + 4n = 3m + 6n$
42 —	43	$m = 2n$
1 ÷ 37	44	$1 = 3r - 3$
44 + 3	45	$3r = 4$
2 ÷ n, 43	46	$2 = 2s - 2$
46 + 2	47	$2s = 4$
5 (*)	48	Let $A = 3$
37, 48	49	$B = 3$
45 ÷ 3	50	$R = \frac{4}{3}$. *i. e.* 16. *Pence*
6 (*)	51	Let $M = 4$
43, 51	52	$N = 2$
47 ÷ 2	53	$S = 2$. *i. e.* 2 *Shillings.*

XXXVII. *Papers* Overlookt *till 'twas too late to insert them in their Proper Places.*

A Diseased Kidney; *by* M. Malpighi. n. 160. p. 607.

Vid. Vol. III. *Par.* I. *Cap.* IV. *Sect.* LIII.

1. Monstruosum aliquid, in Illustrissimi Juvenis *Antonii Francisci Daviæ*, Excelsi *Antianorum* Consulis, Cadavere observatum, non parum exaratam a me *Renum* Structuram illustrat. Hujus *Ren* Sinister, exiguus mole, exterius quasi Congeriem & Racemum Uvæ Albæ exhibebat, multiplicibus scilicet Glanduloſis Folliculis, veluti tot exiguis Botris congestus: Hi Insignibus *Excretoriis* vasis, quibus de more *Renum* caro excitatur, haud donabantur, sed Immediate expanso *Pelvi*, vel saltem breviſſimo Ductu, nectebantur. *Venæ* & *Arteriæ* singula irrigabant, & *Ureter* è *Pelvi* producebatur. *Ren* Dexter mole longe major erat, & exterius insignes *Glandulæ*, quasi *Vesiculæ* Urina turgidæ, erumpebant. Congeries quoque *Excretoriorum* Vasorum, quibus *Renum* caro conflatur, amplior & latior solito erat, & appensæ *Glandulæ* Amplæ quasi *Vesiculæ* interserebantur. Harum aliquæ Corrupto & Subnigricante *Sanguine* Scatebant, reliquæ *Urina* turgebant, vel Arenulis Tartareaque Materia referebantur. Ex hac itaque *Renum*, licet Monstruosa, sed Simplici Structura, evidenter patet, præcipuas *Renum* partes, præter *Arterias* & *Venas*, *Glandulas* esse, & *Pelvim*, qui in *Ureteres* productus in *Glandulis Lotium* per *Excretoria* Vasa recipit, & sensim in *Vesicam* derivat. Turgebant autem *Glandulæ*, & Monstruosa deformabantur Specie, quia impedita *Excrementi* expulsione in *Pelvim*, necessario stagnante intus *Urina*, laxabatur *Glanduloſa* Compages, & in aliquibus etiam loco *Seri* Rubicunda *Sanguinis* portio continebatur; impedito scilicet per *Venas* regressu, vel lacerato separationis Organo. Hoc idem in reliquis *Glandulis* accidit vi Morbi, & præcipue in *Jecore*, in quo vigente *Cachexia* non raro ipsius *Glanduloſi Acini* turgente *Bile*, quandoque *Sero*, aut *Tartaro*, in ampliorem ita extenduntur formam, ut *Vesiculas* emulentur. Simpliciſſima quoque *Glandularum* structura, in pluribus Partibus observata, totum confirmat; nam in Labiis *Bovum*, in *Hominis* Facie, circa *Penis Glandem*, in *Inteſtinis*, & in *Muſculorum* Spaciis Minimæ Simpliceſque locantur *Glandulæ*, quæ nil aliud sunt, quam Rotundi, interdum Ovales, & non raro Oblongi, folliculi *Excretorio* Vasi continuati, & appensi, quorum varia Structura Diversi separantur *Humores* & *Succi*.

The Phosphorus Metallorum; *by Sir* Rob. Southwell. n. 245. p. 365.

Vid. Vol. III. *Par.* I. *Cap.* IX. *Sect.* XI.

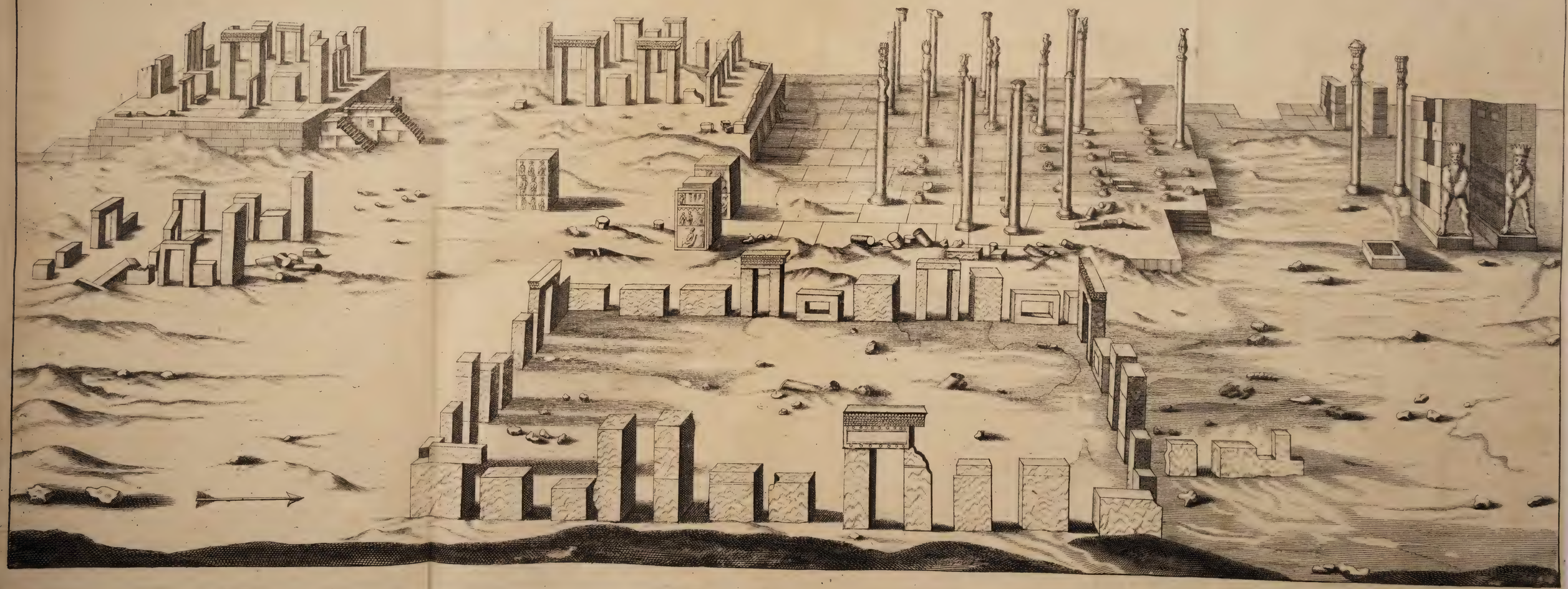
2. Take *Lapis Smaragdi Mineralis* (such as is found in the Mines of *Saxony*) and beat it into a very Fine Powder. If you strew this very fine on any *Metal*, and in any Figure, and set the Plate on any *Hot Coals*, in a short time you will perceive in the Dark a *Light* to shine, which will (saith my Author) last as long as you continue the *Hot Coals*: And if you beat out the Fire, it may do again for Once or Twice; but then the Vertue will fade.

The Texture of Ivory; *by Dr.* Neh. Grew. n. 141. p. 1003. *Fig.* 83.

3. I have often taken notice of the *Grain* of *Ivory*, which upon a due Position to the falling Light is Visible to a Naked Eye: The several pieces, whereof it is Composed, appearing like the *Fibres* of a *Muscle*, running in parcels *Decussatim*, and under and over one another reciprocally, and so making up one Piece of *Platted Work*.

XXXVIII. *Papers*

Fig. 72.



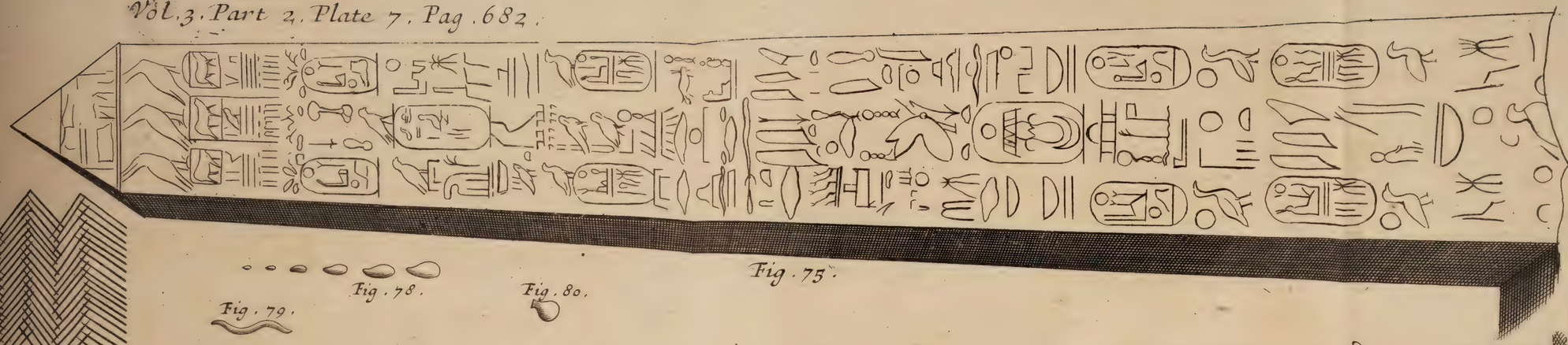


Fig. 75.

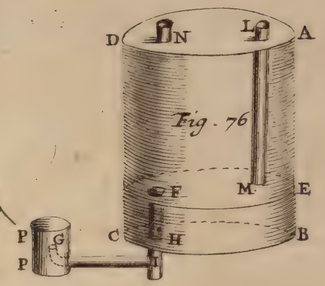


Fig. 76.

Fig. 83.

Fig. 79.

Fig. 78.

Fig. 80.

Fig. 74.

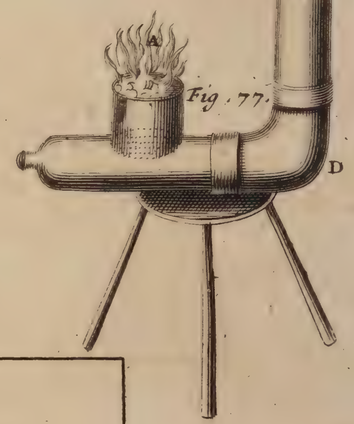


Fig. 77.

Fig. 73.

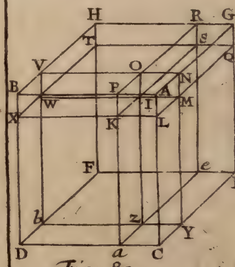
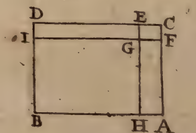


Fig. 82.

Fig. 81.



XXXVIII. *Papers of Leſs General Uſe* Omitted.

1. A Relation of the Advice given by M. *Petit*, touching the *Conjunction* of the *Ocean* and *Mediterranean*; by M. .... n. 5. p. 41.

2. A Narrative of the *Conjunction* of the *Ocean* and *Mediterranean*, by the Contrivance and Management of M. *Riquet*: together with a *Map* of the ſaid *Channel*; by M..... n. 56. p. 1123.

3. Additions to the Foregoing *Narrative*: in which the Progreſs and deſigned *Uſefulneſs* of that *Great Undertaking* are more amply repreſented; by M. *de Froidour*. n. 84. p. 4080.

4. Divers *Rural* and *Oeconomical Inquiries*; by ..... n. 111. p. 240.

5. An Account of ſome of Dr. *Elſholt's* Curious and Uſeful *Experiments*; Communicated from *Berlin* to Mr. *T. H.* *Ph. Col.* n. 4. p. 104.

6. A Miſcellaneous *Catalogue* of Mean, Vulgar, Cheap, and Simple *Experiments*; by Sir *Will. Petty*. n. 167. p. 849.

7. A *Regiſter* of the *Price* of *Corn*, *Births* and *Burials*, Quantity of *Rain*, *Earthquakes*, *Inundations*, and *Remarkable Fatalities*, Solicited by Dr. *J. Beale*. n. 90. p. 5141.

XXXIX. *Letters and Other Papers by M.* Ant. van Leewenhoeck, *Omitted.*

1. A Specimen of ſome Obſervations, made by a *Microſcope* lately Invented by M. *Leewenhoeck*, concerning *Mould* upon *Skin*, *Fleſh*, and other things; The *Sting* of a *Bee*; the *Head* and *Eyes* of a *Bee*; and a *Lowſe*. n. 94. p. 6037. n. 97. p. 6116.

2. Conſiderations touching the *Compreſſion* of *Air*. n. 102. p. 21.

3. *Microſcopical* Obſervations upon *Blood*, *Milk*, *Hair*, *Nails*, and the *Internal Parts* of a *Lowſe* and her manner of *Feeding*. n. 102. p. 23.

4. *Microſcopical* Obſervations concerning *Blood*, *Bone*, the *Liver*, *Brain*, *Spinal-Marrow*, *Fleſh*, *Spittle*, and the *Cuticula*; Alſo upon *Sweat*, *Wool*, *Hair*, *Blood*, *Earthy Particles* in the *Air*, *Fat*, and *Tears*. n. 106. p. 121. *ib.* p. 122.

5. *Microſcopical* Obſervations upon the *Eye*, the *Optick Nerve* and other *Nerves*; upon *Salt*, *Yellow Earth* from *England*, *Flamiſh Earth*, *Clay*, and a *Green Cloud* in *Water* and the *Animalcula* in it. n. 108. p. 178.

6. *Microſcopical* Obſervations concerning the *Optick Nerve*; alſo about the *Texture* of the *Blood*, the *Sap* of ſome *Plants*, the *Figures* of *Salt* and *Sugar* and the probable cauſe of the *Difference* of their *Taſte*; and the *Figure* and *Operation* of *Manna*. n. 117. p. 378. & 380.

7. Obſervations concerning the *Texture* of *Trees*; *compar'd with what has been writ upon that Subject by* Dr. Grew *and* S. Malpighi: Alſo concerning *Animalcles* in *Wine*. n. 127. p. 653.

8. *Animalcles* diſcover'd in *Rain-Water*, *River-Water*, *Well-Water*, *Sea-Water*, and in *Water* wherein *Pepper* had been Infuſed. n. 133. p. 821.

9. The Manner of *Obſerving* and *Numbering* the *Animalcles* in *Water*. n. 134. p. 844.

n. 136. p. 899. 10. Obſervations on the *Carneous Fibres* of a *Muſcle*, the *Pia Mater* and the *Brain*, the *Spinal-Marrow*, *Moxa*, *Cotton*, and the *Roughneſs* within the *Shell* of a *Cheſnut*.

n. 140. p. 1002. 11. *Microſcopical* Obſervations of the *Structure* of *Teeth* and other *Bones*, and of *Hair*.

n. 142. p. 1040. 12. A Letter to my Lord *Brouncker*, *De Natis e Semine Maſculo Animalculis*; Anſwer'd by Dr. *Grew*; the Obſervations further proſecuted by the Author; and Dr. *Grew*'s Opinion *de* Vaſis *in Craſſa Seminis Materia Obſervatis*.

Ph. Col. n. 1. p. 3. 13. *Animalcles* Diſcover'd in the *Melt* of a *Live Cod-fiſh* and *Pikes*; in the *Vaſa Deferentia* of a *Male Hare*, and of *Birds*; and in the *Teſticles* of a *Dog*, and a *Cock*.

Ph. Col. n. 3. P. 51. 14. *Microſcopical* Obſervations on *Lees of Wine*, *Blood*, *Fermenting Syrups*, *Water*, the *Liquor* in the *Venæ Lacteæ*, the *Chyle*, *Milk*, *Urine*, the *Watry Parts* of the *Air*; the *Semen Maſculum* of *Inſects*; *Pepper-Water*; together with his Method of *Calculating* the *Minuteneſs* of the *Animalcles*.

Ph. Col. n. 4. P. 93. 15. The *Structure* of *Hair* and its manner of *Growing*; The *Excrements* of *Men* and other *Animals*; and the *Particles* of *Clay*.

Ph. Col. n. 5. p. 152. 16. The Texture of the *Muſcles* of *Quadrupedes* and *Fiſh*; the Growth of *Hair*; the *Blood* of *Fiſh*; the *Fins* of *Oyſters*; and the *Production* of *Oyſter-Shells*.

Ph. Col. n. 7. p. 188. 17. The Texture of the *Muſcular Fleſh* of *Lobſters* and *Prawns*.

n. 145. p. 74. 18. The *Generation* of Animals *ab Animalculo* and not *ex Ovo*; The Parts and *Generation* of *Fleas*; The *Fleſh* of a *Louſe*; The *Fleſh* and *Feathers* of a *Gnat*; *Sal Volatile Oleoſum* mixt with *Blood*; No *Air-Bubbles* in *Blood*.

n. 148. p. 197. 19. The *Texture* of ſeveral ſorts of *Trees*, and their *Five* ſorts of *Veſſels*; *Animalcles* in the *Melts* of *Fiſh*.

n. 152. p. 347. 20. The *Generation* of Animals *ab Animalculo in Semine Maſculo*, particularly of *Froggs* and *Fiſh*; The *Veſſels* and *Muſcles* of a *Frog*; *Digeſtion* by the *Motion* of the *Stomach*; *Circulation* of the *Blood*; and the *Cauſe* of *Feavers*.

n. 159. p. 568. n. 197. p. 646. 21. *Animalcles* in *Spittle*; in the *Scurf* of the *Teeth*; the Suppoſed *Worms* in the *Skin*; and the *Scales* upon the *Skin*.

n. 160. p. 586. 22. The *Cuticula* of the *Mouth* and *Lips* covered with *Scales*; The reaſon of the *Tickling* by a *Hair* lying upon the *Skin*; A *Scaly Child*; the *Slime* within the *Guts*; the *Lacteal* and *Lymphatick Veſſels*; and the Uſe of the *Slime* within the *Guts*.

n. 165. p. 780. 23. The *Cryſtalline Humour* of the *Eye*; the Uſe of the *Eye-Lids*; and the *Red Particles* of *Blood*.

n. 168. p. 883. 24. The *Brain* of ſeveral *Animals*; the *Chryſtalline Humour* of an *Humane Eye*; *Moxa*, and other *Downy* Subſtances; the *Chalk-Stones* of the *Gout*; the *Leproſy*; and the *Scales* of *Eels*.

25. The

25. The *Salts* of *Vinegar*; *Crabs-Eyes* and *Chalk* Diſſolv'd in *Vinegar*; The *Particles* of *Water*; the *Salts* of ſeveral ſorts of *Wine*; *Tartar*, *Crabs-Eyes* and *Chalk* Diſſolv'd in *Wine*. n. 170. p. 963.

26. The *Salt* of *Carduus Benedictus*; *Salt* of *Worm-wood*; *Allum*; *Salt-Petre*; *Blew Vitriol* of *Cyprus*; *Oyl* of *Tartar per Deliquium*; *Muſcovy Pot-Aſhes*; *Camphir*; *Salt* of the *Aſhes* out of an *Iron Foundery*; *Salt* of the *Aſhes* of a *Tin* or *Lead Oven*; *Salt* in *Quick Lime* and in *Lime* of *Fiſh-Shells*; *Salt* of *Engliſh Soda*, and of the *Soda* of *Britany* and *Alicant*; and *Sal Armoniack*. n. 173. p. 1073.

27. The *Generation* of *Animals ab Animalculis in Semine Maſculo*; The *Semen Maſculum* found in the *Uterus*; and the *Propagation* of *Plants*. n. 170. p. 979. n. 173. p. 1090. n. 174. p. 1120.

28. *Animalcles* in the *Teſticles* of a *Rat*; in the *Seed* of *Muſcles*; in *Oyſters*; and in the *Sap* of *Vines*. n. 196. p. 593.

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